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THE ESSENTIALS OF SCHOOL DIET

*OR THE DIET SUITABLE
FOR THE GROWTH AND DEVELOPMENT
OF YOUTH*

BY

CLEMENT DUKES, M.D., B.S., LOND.

MEMBER OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON
PHYSICIAN TO RUGBY SCHOOL
SENIOR PHYSICIAN TO RUGBY HOSPITAL
HOWARD MEDALLIST OF THE ROYAL STATISTICAL SOCIETY OF LONDON

SECOND EDITION, REVISED AND ENLARGED

WITH A

PREFATORY NOTE

BY

SIR WILLIAM BROADBENT, BART., M.D., LL.D., F.R.S., F.R.C.P.

*Physician Extraordinary to Her Majesty the Queen
Physician in Ordinary to H.R.H. the Prince of Wales*

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PREFATORY NOTE

BY SIR WILLIAM BROADBENT, BART.

M.D., LL.D., F.R.S., F.R.C.P.

PHYSICIAN EXTRAORDINARY TO HER MAJESTY THE QUEEN,
PHYSICIAN IN ORDINARY TO H.R.H. THE PRINCE
OF WALES.

DR. CLEMENT DUKES has earned the right to speak with authority on all matters relating to the health of boys and girls during the important period of school life. He has enjoyed unexampled opportunities of studying the ways and the needs of the boys of a great public school, and of the younger boys at preparatory schools, and he has extended his inquiries to schools of the most varied character. The results of his observations

are embodied in two important works, "Health at School" and "School Diet," the latter of which is going into a new edition.

This book is not a mere dry exposition of dietary principles. From the first the note is struck that in the proper regulation of food, it is not only the health of the boy or girl which is concerned, but the intellectual efficiency and, it may be, the moral welfare.

Dr. Dukes points out that, in addition to adequacy in the amount of food provided, the quality, variety, good cooking, and proper serving should be seen to, and that the duty of the house-master does not end even here: he should see that each boy gets his proper share, and that

it is eaten. Dr. Dukes insists on all these points with pardonable and perhaps necessary iteration, and not only shows what ought to be done, but how it can be done. Parents also come in for a share in his exhortations, and the book is one to be read and studied by parents as well as by house-masters and matrons.

Two important points in Dr. Dukes' teaching may be selected for special emphasis: the first, that stimulants are entirely unnecessary as part of the diet of the young, and, in most instances, harmful; the other, that the food of the day should be so distributed that any evening meal is light.

W. H. BROADBENT, M.D., F.R.S.

PREFACE TO THE FIRST EDITION

THIS short treatise is designed to serve as a practical guide to parents, schoolmasters, and schoolmistresses, concerning the food required by the youth of this country during their years at school.

My aim has been throughout to insist upon those conditions which are requisite for the attainment of the highest state of growth and development in the youth of both sexes, without touching the borderland even of luxury.

It has, in fact, been my object to suggest for young human beings what the agriculturist seeks to obtain amongst animals: the production of the finest specimens of the race. And this comparison suggests the statement that, unhappily, at the present time, more care and

thought are expended in the rearing of animals, than in the efficient development, from this point of view, of the offspring of human beings.

It is not within the province of this work to discuss the school-diet question from the lowest standard. I refer to that school-diet which is regulated to such a nicety, on account of the consideration of expense, that illness is just averted, while growth and development are totally ignored. It has been only too easy, from time immemorial to the present day, for schools to provide "short commons;" and it is simply by strenuous and persistent teaching and effort, that a proper standard of responsibility and supervision in this respect can be inculcated.

The question of the lowest standard of diet necessary for children arises chiefly in prisons, reformatories, workhouses, orphan asylums, charity schools, and the poorest class

of schools. But, even here, I maintain that the cheapest policy, in the long run, for the rearing of youth, is to feed them well, so that they may be aided to attain the maximum of size and strength. If they are thus helped to reach the healthiest adult age, more and better work will be obtained from them, with more vigorous brain power and higher characters, and with fewer cases of incapacity and deficient energies.

I am, therefore, now mainly concerned with the great public schools of England, and with those estimable high-class private schools, which supply the public schools with pupils, and which have done so much, not only to advance the education of this country, but, still more, to improve the tone and remove many of the harsh features of the great schools,—results which could scarcely have been attained without the exercise of their influence during the early years of the boys they educate.

In both these types of schools, it is expected that ample food of the best kind, varied from day to day, and from season to season, and cooked in the most approved fashion, will be supplied.

It is desired that this book may prove to be the means, not merely of obviating the exorbitant demands of parents, but also of preventing the possibility of an insufficient supply of food being provided by the masters themselves. Food is insufficient no less by defect of quantity and quality than by the absence of an adequate *variety*. No efficient digestion, no liveliness of disposition, can be produced without variety of food ; monotony of diet generates monotony of character, through the want of nutrition it engenders.

I have only ventured to discuss this burning question fully, after twenty years' consideration of the subject, obtained by close

observation, minute and wide inquiry, and careful study.

It must in no degree be inferred that I describe in these pages the dietary arrangements of the school which I have the honour to serve. I have, on the contrary, endeavoured—and I think successfully—to keep Rugby out of my mind : it is needless to state, however, that the office which I have held for so many years has furnished me with the insight and experience to detect the good and bad aspects of these arrangements in all schools, and to clearly comprehend from this point of view the requirements of youth.

The apparent detection by my readers of any reference, direct or indirect, to some particular school, will possess no valid ground, and will only signify that the principles I shall venture to express are true by reason of their universal applicability.

Some amount of repetition has been unavoidable, inasmuch as my aim has been to render each section complete in itself. In this way the reader, who uses the volume for reference, has been saved the trouble of turning to various parts of the book for the information he desires.

I desire to acknowledge my indebtedness to the work of Mr. Wynter Blyth, on "Diet in Relation to Health and Work," for the valuable tables showing the percentage composition of the various articles of diet.

CLEMENT DUKES.

RUGBY,

January, 1891.

PREFACE TO THE SECOND EDITION

IT is now eight years since this little book was issued, and a new edition is demanded. The intervening period has been marked by considerable progress in all that relates to the welfare of the young during their time of education. Among other improvements, more thoughtful attention, and increased conscientiousness, have been expended on the school commissariat. Now that we are to develop our resources by the extension of Secondary Education, a more sedulous care is imperative.

One of my kind reviewers of the First Edition, in commending the book, remarked, that while some of my suggestions were excellent, they were impracticable. I am too old a

hand to miss the weak points in a system, and their remedy.

If points which I have suggested can be considered impracticable, when they are already carried out in the best class of schools, then I admit the charge. I mean those schools which are conducted by headmasters and mistresses who are educators, and not mere teachers.

I have not yet made one suggestion which is not workable,—nay, which is not already being practised in some good school, and which I insist should be adopted in all.

For what I complain of is, that the “terms” are quite as high in schools where the pupils are too much neglected, as they are in schools where they are well cared for in every way.

The greatest requirement in all schools—but lacking in many—is *personal* supervision in *details*. It is a favourite expression for masters and mistresses to aver that they are

in loco parentis : I grant it. But, if this be not a mere idle form of words, it means that the same thoughtful care which the parent exercises over his child is due from the teacher to the pupil, and in no question more than in this one of food. I ask no more than this : I demand no less.

CLEMENT DUKES.

RUGBY,

July, 1899.

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I.

INTRODUCTION.

THE subject of SCHOOL DIET is obviously of vital interest, since the mode in which the physical system is affected in this respect in early life must possess a potent influence upon the development of that system, and, incidentally, of the mental and moral capacities, in the child's subsequent career.

I wish it to be thoroughly understood, *in limine*, that, throughout this treatise, my remarks have equal reference to schools for boys and girls.

The food-supply at schools has always engaged considerable attention on the part of the boys and girls themselves. It has been generally a sore point with them ever since the custom arose of sending children away from home to boarding-schools for education. For it touches an organ—the stomach—which,

throughout the whole animal creation, but more especially amongst the human race, has a peculiar sensitiveness of its own on this question.

I cannot, of course, discuss here the various traits of character which are manifested when the stomach is an "aching void." Nor, on the other hand, can I do much more than testify to the opposite features of character which a well-filled stomach tends to foster or helps to produce. Nor am I able to do more than refer to the variations in temper which are occasioned by indigestion arising from the devouring of inappropriate food and drink; from its consumption at unadvisable hours; or from the hurry immediately after meals. These influences are too well-known to require more than passing notice, since it is admitted that the sensations have a great effect upon the training of the disposition and character of the young. What a much easier and serener time masters—and boys—would enjoy if human beings were less under the influence of the stomach!

The view entertained, by many parents, of

the public school system seems to be this : that it consists of large schools where boys have to rough it. Defined in detail they would describe it thus: it is a school where high fees have to be paid ; where the boy lacks all necessary supervision, and is almost totally neglected ; where the food-supply has to be supplemented, as well as the supply of covering for his bed ; and where he is very imperfectly housed by day and night. If this conception of public schools were ever accurate, which I am not in a position to dispute, and which I am disposed to credit, on account of the very bitter reminiscences recorded by so many parents of their own past youth ; still, I am bound to admit that this is not my experience of the public schools of the present day. *Nous avons changé tout cela.* I am convinced that the public schools of England, constituted as they now are, mostly, if not entirely, provide a good education mentally, morally, and physically ; and that the boys are usually well cared for in every particular.

Rightly or wrongly, the treatment of the young at boarding-schools has been frequently regarded by parents and pupils as a process of semi-starvation on the "Do-the-boys'-Hall" principle. Hence we continually find adult writers speaking of their insufficient dietary during school-life, with more or less painful remembrances of the hardship and suffering which the pangs of hunger then entailed.

Nor is this question dormant in the present generation. It involves such widespread interest that, from time to time, it takes the form of a discussion in *The Times*, where we read the various opinions and suggestions of those who partake of the diet, those who supply it, and those who pay for it.

I, therefore, propose to look into the matter, to sift it, and to try to discover whether these complaints are just, and if so, to suggest their remedy; while, if they are thus found to be groundless, I shall endeavour to point out their origin, the responsibility for the fault, and the mode in which the complaints are to be obviated.

At one of the schools where I received part of my education, I could not find fault with the *quality* of the food—hungry stomachs are not amenable to *this* charge—for I rarely knew what it was to have enough to eat, as even the bread and meagre butter were limited; and many a time have I purchased a roll of bread immediately after dinner, to supply the gap which a scanty meal had left.

If we go back a generation further, we have, in the life of a nobleman recently issued, a vivid account of his hardships at school, where “he suffered exquisite misery for years through the neglect and inhumanity of the principal of the school in failing to provide sufficiently even the necessaries of life, and where the treatment was starvation and cruelty.”

And if we take the generation subsequent to my own, we find that the starvation experienced while journeying “In Darkest Africa” reminded one of the members of the Expedition of the painful sensations of his school-life.

Nowadays the same fault occurs in some

schools; but the outcry is mainly against the *quality* of the food, involving the evidence that the *quantity* is not deficient. If complaints are heard that children at school do not get sufficient to eat, parents should ask the master to show them, or, better still, the master should invite the parents to see, the *waste* of one day—a surer test could not be found. If the waste is *nil*, then the children probably get barely enough; while if the waste is great, it is clear that they have more than enough, for hungry stomachs do not waste food, *unless* it is so bad, or there is so much sameness in it, that it nauseates the stomach and cannot be eaten. The present waste, if obviated, would more than pay for more variety of food, better puddings, and for oranges and apples during the winter months, when it is next to impossible to induce children to eat winter greens.

It seems to me that very valuable lessons would be learnt by schoolmasters if they would from time to time carefully inspect for themselves the waste that goes on in their houses,

and occasionally examine the contents of the hog-tub—indeed, it seems to me their imperative duty to do so, and to do it systematically. If this supervision were carefully and conscientiously carried out, more instruction would be derived, if what they saw and found were traced to its source, than could be obtained by any other means.

There is no doubt whatever that in this question of school dietaries there are faults on all sides. Parents are often unreasonable in their expectations ; children are frequently fastidious to a degree ; and masters rarely give the subject the attention it requires. And when we reflect how human nature delights in being discontented, it is surprising that complaints do not more frequently arise.

That the food at school is sometimes *deficient in quantity* is beyond all question true, and this is absolutely indefensible. A growing child should never be stinted in its materials of growth, so that at this important period of life the tissues may be nurtured without the serious

detriment of feeding on themselves. If the payments demanded from parents are insufficient to cover this, it is imperative that the payments should be augmented, and that the growth of the child should not be stunted for life. For the ground lost at this period of life is never recovered.

Sometimes the food is deficient in quantity while plenty is provided. This is rather an "Irishism," but I will make myself clear. The condition may occur under the following circumstances:—

1. Because the strong boys get possession of the food of their weaker, or more bashful, school-fellows, and either leave insufficient for them, or a complete absence of the choicer bits,—securing, for example, the best joints or the prime cuts off the joint, and taking an unfair advantage of the loaf of bread.

2. Because the meals are unwisely arranged, or improperly divided, so that although the orthodox amount may be provided of each article of diet by weight or measure, yet, owing

to the unwise division of the meals, the child does not receive his due amount of food. For instance, if bread and butter only be provided for breakfast, say at 8 a.m., this will be digested and used up by the system long before dinner takes place at 1.30 p.m., and therefore from about 11 a.m. to 1.30 p.m. the body will be starved. Then at dinner the boy can only eat a certain amount of food, however much the caterer may supply, and thus the defect of the two hours and a half of starvation is never recovered, although growth must take place all the same. The remedy consists in giving a good lasting meat meal at breakfast.

3. Because the diet is so monotonous that children will leave their meals, although they are hungry, rather than eat what their stomach loathes on account of the sameness of the food.

Even assuming that schools provided the most expensive foods, if there be too much sameness, and they be too frequently supplied, the stomach rebels, the system starves, and growth and development are, in consequence,

imperfect. I have heard the story told of one of the highest personages in this country, that he regards it as one of the greatest treats to be permitted to eat a plain mutton chop off the gridiron. In olden times, too, it was a common practice for the indentures of an apprentice to contain a clause stipulating that he should not have salmon more than twice a week during the season, since owing to its abundance it was cheap, and thus became a prevailing dish for the apprentice. The most tasty articles of food always nauseate the soonest, and, when this state of affairs is induced, starvation will be faced rather than a continuance of the offending article endured.

At other times, while there is *no deficiency in quantity*, the quality, the variety, and the cooking of the food are unsatisfactory. It is too often the case that neither the master nor his wife themselves supervise the school dietary with sufficient attention. This would not signify in the least if care were always taken, and judgment exercised, in procuring a really

efficient matron, or housekeeper, whose duty it should be to personally see to the food-supply from the time it leaves the tradesman's shop until it reaches the child's stomach, and who alone should be held responsible. For it would be probably far better selected, varied, and cooked if the daily supervision were allotted definitely to one who had been trained for the purpose, and chosen because of capacity for the office. But anything more unsuitable and inefficient than some of the matrons in schools it is difficult to imagine. The last point in their selection that seems to have been considered is their capacity for the post ; and, worse still, when a really capable matron has been found, who knows her duties well, strives to do them, and sees that her subordinates faithfully perform their work, it often happens that, instead of recognizing her value, and affording her hearty support in her difficult work, she is too often removed, and an inefficient matron procured in her place. The consequence is, that this food question is generally left to take care of

itself, with consequences that affect the boarders for life. Those only who have had to deal with really competent matrons know their priceless value in schools, both to pupils and to principals.

Again, while a master may be generously disposed, his wife may be the reverse, and thus the boarders suffer ; or, while the wife is liberally inclined in the school dietary, she may be so stinted in "supply" that she cannot efficiently provide.

No one who caters for the feeding of children at school can satisfy his conscience that he has done his duty by simply drawing a cheque sufficient to provide an ample dietary. It is his imperative duty to see that the pupil actually receives what is his due. Anything short of this is tantamount to neglect.

There is no doubt, too, that it is the tendency of human nature to purchase the cheapest articles in the cheapest market,—a principle which often means the absence of principle.

There are also minor matters, though by no

means of small importance, which demand the care of the master ; such as seeing that the big boys do not secure all the best cuts of the meat, and do not eat all the potatoes ; that the meat is carefully carved, and not hacked into lumps ; that the knives and forks and other requisites for meals are well cleaned ; that the meals, served hot from the kitchen, are expeditiously and fairly served in the dining-hall.

It is also a duty of paramount importance for the caterer to inquire into the cause of a pupil not eating his food at meal-times. Is it because he has been to the pastrycook's, or has he received a hamper ? Is it because the meat is tainted in hot weather, or is the meat coarse and badly cooked ? I have heard these reasons assigned too frequently not to believe them ; and, even while writing this book, I learn from a master who had his food with the pupils, that the meat was unfit to eat, for the reasons specified. Is the child ill, and therefore cannot eat his food ? I have known children refuse most of their food for a day or two, or fail to

eat their dinner for days, and yet no one was aware of the fact, because it was nobody's business to investigate. Yet children require, and have a right to, this requisite supervision.

It is a well-known fact that masters too frequently neglect the consideration of these matters, and no one else attends to them. Every child who does not eat his food should be known to his master, and careful inquiry should be made into the cause. It is contrary to nature that a child should not take his food ; a palpable cause always exists in such a case, which only requires investigation for removal. It should never be forgotten by those who have themselves completed their growth, that adults often sit down to their meals seeking appetite, rather than food ; while growing youth requires food rather than appetite,—unless abnormal conditions predominate.

It is clear that masters will never really know the actual details of school meals until they adopt the plan of themselves having no stationary seat at meal-times, but a movable one, so that

when they enter the dining-hall at any meal none of the subordinates should know where they will sit. They could then touch any boy on the shoulder and say, "Go and take my seat," at this meal. He could then sit in the boy's place, use his appliances, be served in his stead, and eat his food. Then he would see for himself where the "shoe pinches."

He should, especially, occupy the seat of the lowest, which means sometimes the youngest, slowest, and most frail boy in his house, and *be served* LAST. In this way he would realize, to its full extent, the shortness of time that the tedious eater is allowed for his meal. For it often happens that the elder boys, which usually means those who are served first, have actually finished a course before the last boy is served; and yet they all leave the table together. This, therefore, signifies that the little delicate boy must either go without part of his food, or bolt it to the serious detriment of his already impaired digestive organs. Perhaps he is a dunce, and worried because of his

ignorance ; but how is he able to make healthy, vigorous brain tissue, which alone can produce brain function, while thus treated ? Where is the “ Age of Chivalry,” where is the “ Christian Life,” when the strongest take care of themselves, and every facility is provided “ by authority ” in this direction ; while the “ weakest go to the wall,” and never receive a helping hand from those who have assumed the place and the duties of parents, and who are paid to exercise this necessary supervision ?

Another plan would consist in some responsible person being deputed to walk about the dining-hall during meal-times, and closely investigate every detail.

Another help would be for the teacher to *encourage boys and girls* to make complaints, which, at present, is not even tolerated ; or still better would it be, if the master would regularly seek information from those at the top and those at the bottom of the school—especially the latter—and then carefully consider the reports. In this way unreasonable

complaints would never occur, for it is a law of human nature that, when any one can readily obtain redress of his real grievances, groundless and frivolous complaints do not arise.

I have no hesitation in saying that, at the present moment, in most schools, no boy dare make a legitimate complaint to his master, however reasonable, as to the quantity or quality of his food, or the cleanliness of his meals. He would not be listened to, or he would be snubbed, or he would do it "at his peril." Consequently he makes illegitimate complaints at home, which cannot be investigated, and which frequently would not bear investigation.

The way in which a complaint concerning the school food should be met is shown in the following instance. It occurred recently in a first-class school, where the master knows and does his duty. A boy found fault with his meat at dinner. The master immediately sent for the butcher who supplied the meat, and the doctor who attended to the health of the school ;

the latter was asked, in the presence of the former, whether the meat was such as should be supplied for young and growing boys. As the doctor was unable to condemn the meat, the butcher escaped censure. The complainer must have felt uncomfortable: he scarcely realized that his complaint would receive so careful investigation.

Now, the point I wish to impress is this: that if similar care were bestowed upon all complaints, those arising from the caprice and daintinesses of the individual would at once cease, and parents and pupils would be more contented, and masters happier. Whereas complaints at present, whether just or unjust, are usually totally ignored, or the complainer is censured. It is obvious that the wise, as well as the equitable mode of treatment, just to both masters and boys, consists in a patient, fair, and exhaustive investigation on the spot.

But where a *parent* makes complaints, the best plan to satisfy him would be to invite him to "drop in" at any meal when neither master,

boy, nor servants would expect him, so that he could see and taste for himself.

Any one of the above plans would be possible and effectual. In fact, in some schools—far too few—one or other of these methods is already in vogue, although the number of pupils may be over a hundred. The difficulty, if there be one, is not in carrying it out, but in recognizing its importance.

On the other hand, there are boys who are so fastidious that nothing pleases them, however well provided.

Others, who are so petted and pampered at home with rich delicacies that it takes some time at the beginning of every term for their stomachs to settle down to plainer and more wholesome food. Pocket-money, again, is too lavishly supplied to them when at school: the stomach consequently is often imprudently regaled with luxuries before instead of after meals, so that the regular school food is either left untouched, or simply picked over with more or less disgust.

But there are others who, from delicacy of stomach or of constitution, are unable to eat plain food, however wholesome, unless it is cooked well and served well, and unless they have ample time to masticate it thoroughly. The latter condition is too much neglected at schools.

Of course there is the remaining class, consisting of grumblers, who find fault with everything and everybody but themselves, and whose meat and drink, on which they apparently thrive so well, is grumbling.

I think it will be granted on all hands that the complaints about the paucity of food at school, as well as of its inferior quality and monotony, are not altogether groundless. That the school dietary is sometimes all that can be desired, in every respect, goes without saying.

I also believe that occasionally the food is not what it ought to be, owing to the meanness of disposition of the caterer.

Without a doubt, these dietary defects generally arise mainly through inattention to the

subject, and want of knowledge of the essentials and the importance of an appropriate diet for the young. But inasmuch as schools have necessarily assumed the functions of caterers, or hotel-keepers, for the boys under their charge, ignorance and inattention in this branch of the scholastic profession are as inexcusable as would be the exhibition of similar defects in respect of tuition. If this be denied, it is imperative that a different body of men should assume these functions, and leave the scholastic profession to revert to its former duties of tuition only; but when we have only just abandoned "dames' houses," no one will recommend that these two branches of a schoolmaster's work should be ever again divided.

It is, therefore, as important that a master (or his wife) should qualify as a caterer, or should employ a highly skilled matron, as it is that he should qualify himself to teach languages, mathematics, or science. And the results of his failure in the former branch of his profession have far more deleterious effects on the health

of the pupils than incompetence in his capacity for teaching has on their educational prospects. For it is beyond all question true that the health and strength of the individual can be made or marred more permanently during the ten years of life at school—*i.e.* from nine to nineteen years of age—than during any other period of life, except perhaps the first year of infancy.

It is during these years that, according to the situation of the school, and the treatment which the child receives, the delicate child can overcome its delicacy and be made permanently strong, or even the strong child rendered weak and stunted for life.

This question of school dietary is no trifling one to a parent or a pupil. When families remove from their homes, whether it be to lodgings or hotels, if the food be not such as they desire, they can at once depart. Not so at school. When a child leaves home to spend his youth at school, there he must remain, as it is impossible to shift him from school to school without detriment to his education.

It, therefore, behoves schools to see that no ground of complaint exists concerning the diet ; and it is no less incumbent upon parents to refrain from unnecessary discontent, and to cease to expect children at school to be fed on injurious luxuries.

But parents have a right to require, and children at school have a right to receive, sufficient food, and of good quality.

The canon, therefore, on which I propose to insist in this treatise is, that there shall be at all schools good, wholesome, plain food, and plenty ; that it shall be varied, well cooked, and efficiently and promptly served.

The main questions which we shall have to discuss, therefore, are :—

1. What is the good, wholesome, plain food which is suitable for youth ?

2. And what constitutes plenty for adolescents through their chief years of growth and development ?

The most unfortunate part of the career of youth consists in the fact that education has to

proceed *pari passu* with physical growth. This cannot be obviated. For all education must take place while the tissues are in a nascent state, since in this way only can they be developed into their highest state of perfection, whether they be nervous or muscular. But its evil will be greatly lessened when those schools which undertake the care of youth from nine to fourteen years of age, and those which further feed and educate them from fourteen to nineteen years of age, fully recognize their duty, so that education may not be accompanied by dietary stinting, deleterious both to body, mind, and character.

It is an indisputable fact that the best developed nations are those which are suitably fed during their growth: equally true, that the best working, the most enterprising, and the most courageous nations are also the best nourished.

It is recorded that the English labourers, who, in 1841, constructed the Paris and Rouen railway, beat the French navvies at their work

by a third. The engineers then put the French gang on the English diet, and they drew level again. It was a victory of "The Roast Beef of Old England" over vegetables and soup.

II.

THE PRINCIPLES OF DIET ; OR, WHY DO WE EAT AND DRINK ?

Life.—All animal life, in the process of living, tends to destroy itself by the wear and tear which the process occasions. This is the natural course of LIFE,—unless something ensues to prevent it.

“The human body is a furnace which keeps in blast three score years and ten, more or less. It burns about three hundred pounds of carbon a year (besides other food) when in fair working order, according to a great chemist’s estimate. When the fire slackens, life declines ; when it goes out we are dead.”¹

Death.—This destruction, or DEATH, inevitably takes place, the length of time varying according to the vitality of the animal life, unless something is supplied to the animal system which shall not only cover the loss of

¹ Oliver Wendell Holmes.

material thus occasioned, but shall at the same time supply a sufficient surplus to enable the animal to attain its mature development.

The fact has been¹ well expressed thus : “ Our environment is that in which we live and move and have our being. In the organism lies the *principle* of life ; in the environment are the *conditions* of life. It is the environment which sustains life, and no animal life can exist without being in correspondence with the various environments. Every living thing normally requires for its development an environment containing air, light, heat, and water. . . . In addition to these, if vitality is to be prolonged for any length of time, if it is to be accompanied with growth, and the expenditure of energy, there must be a constant supply of *food*.”

The detritus which arises from the wear and tear, whether it be gaseous, fluid, or solid matter, is produced as the result of the combustion which takes place within the body between the tissues and the air which is inspired ; and this combustion generates animal heat exactly

¹ “ Natural Law in the Spiritual World,” Drummond.

in the same way as heat is produced in our domestic fire-grates ; and the same gases are formed in the two processes.

Food.—The material necessary to obviate the natural destruction of animal life is termed FOOD, which varies greatly for the different species of the animal kingdom.

Diet.—The combination of foods necessary for the human being is called DIET, which differs considerably for different individuals and races according to their climate and seasons, their taste and circumstances, and their occupations and ages.

But the motto for all, under all circumstances, should be—

“Ede ut vivas, sed non vive ut edas.”

There is a point which is of paramount importance in connection with this food question, and which scarcely receives the attention it deserves, viz. that *ex nihilo nihil fit*. Not a moment's work is possible without the consumption of the requisite material for its production ; nor can an atom's growth in height or weight be added to the body without a similar expenditure of

material, which must be furnished by the body itself, or be provided from its environment. Moreover, it must be borne in mind that, even during the actively growing years, it is only after wear and tear is provided for, that any surplus is available for the purposes of growth.

Stages of Life.—The life of the human being as far as his food is concerned, may be divided into the following five stages:—INFANCY, CHILDHOOD, YOUTH, MANHOOD, AND OLD AGE. Each epoch has its own appropriate diet, by means of which health and strength may be maintained, and disease and death averted. The food which is suitable in quantity and quality for one phase of existence is most inappropriate for another, and, if persisted in, ill-health or disease must inevitably ensue.

Infancy.—Thus, in the early period of INFANCY, until the child is nine months old, the food should consist entirely and solely of milk. As the infant grows, farinaceous food should be added to the diet; and then, in the last period of infancy, a small quantity of animal food, in various forms, should be introduced.

Childhood.—During the years of CHILDHOOD, the diet should be mainly milk and farinaceous food, with a small quantity of meat and vegetables.

Youth.—With the exception of the first year of infancy—which is so largely a woman's question, and which is so grievously neglected—the food furnished during the period of YOUTH is the most important of all; but it is too little regarded, to their serious detriment.

Consider the strides of growth and development which take place during these years, when the girl leaps into womanhood almost at a bound, and the boy grows to a still greater extent, but fortunately takes more time about it. Consider, too, the vast quantities of food that are then consumed before an inch is added to the height, or a pound to the weight of the body. The importance of the question can then be realized.

I am not prepared to say that plenty of food during youth will add a cubit to the ultimate stature, though respecting it there can be little doubt; but it is absolutely certain that a

deficiency of food during this period of life will take a cubit off the stature.

This fact has been so clearly set forth by the patient and painstaking investigations of Dr. Charles Roberts, that I cannot do better than insert his valuable tables here.

TABLE showing the average and mean height and weight, and the annual rate of increase, of 7855 boys and men, between the ages of 10 and 30, of the *artisan* class—town population—

Age last Birth- day.	Height, without Shoes.				Weight, including clothes of 9 lbs.			
	Average.	Growth.	Mean.	Growth.	Average.	Growth.	Mean.	Growth.
	Inches.	Inches.	Inches.	Inches.	lbs.	lbs.	lbs.	lbs.
10	50·52	—	50·50	—	66·31	—	66·0	—
11	51·52	1·00	51·50	1·00	69·46	3·15	70·0	4·0
12	52·99	1·47	53·50	1·50	73·68	4·22	74·0	4·0
13	55·93	2·94	55·50	2·50	78·27	4·59	78·0	4·0
14	57·76	1·83	58·00	2·50	84·61	6·34	84·0	6·0
15	60·58	2·82	60·50	2·50	96·79	12·18	94·0	10·0
16	62·93	2·35	63·00	2·50	108·70	11·93	106·0	12·0
17	64·45	1·52	64·50	1·50	116·40	7·66	116·0	10·0
18	65·47	1·02	65·50	1·00	123·30	6·97	122·0	6·0
19	66·02	0·55	66·00	0·50	128·40	5·08	128·0	6·0
20	66·31	0·29	66·25	0·25	130·60	2·20	132·0	4·0
21	—	—	—	—	—	—	—	—
22	66·60	0·29	66·50	0·25	135·40	4·81	136·0	4·0
23-30	66·68	0·08	66·50	—	139·00	3·58	138·0	2·0

TABLE showing the average and mean height and weight, and the annual rate of increase, of 7709 boys and men, between the ages of 10 and 30 years, of the most favoured classes of the English population—public-school boys, naval and military cadets, medical and university students—

Age last Birth- day.	Height, without Shoes.				Weight, including clothes of 9 lbs.			
	Average.	Growth.	Mean.	Growth.	Average.	Growth.	Mean.	Growth.
	Inches.	Inches.	Inches.	Inches.	lbs.	lbs.	lbs.	lbs.
10	53'40	—	53'00	—	67'4	—	67'0	—
11	54'91	1'51	54'50	1'50	72'9	5'50	73'0	6'0
12	56'97	2'06	56'50	2'00	80'3	7'39	80'0	7'0
13	58'79	1'82	58'50	2'00	88'6	8'27	88'0	8'0
14	61'11	2'32	61'00	2'50	99'2	10'61	98'0	10'0
15	63'47	2'36	63'50	2'50	110'4	11'21	110'0	12'0
16	66'40	2'93	66'50	3'00	128'3	17'92	126'0	16'0
17	67'84	1'46	68'00	1'50	141'0	12'69	140'0	14'0
18	68'29	0'43	68'50	0'50	146'0	4'97	146'0	6'0
19	68'72	0'43	68'75	0'25	148'3	2'20	148'0	2'0
20	69'13	0'41	69'00	0'25	152'0	3'87	150'0	2'0
21	69'16	0'03	—	—	152'3	0'27	152'0	2'0
22	68'93	—	—	—	154'7	2'44	—	—
23	68'53	—	—	—	151'7	—	—	—
24	68'95	—	—	—	149'2	—	—	—
25-30	69'06	—	69'00	—	155'2	0'42	154'0	2'0

During the period of youth there should be a tolerably even balance between the amounts of farinaceous and vegetable food, with a large

preponderance of animal food ; the total supply required being largely in excess of that demanded by adults, in order to supply the material necessary for growth and development, as well as wear and tear.

In all the *three* periods of life above enumerated, the main indication is that sufficient nitrogenous food must be afforded for growth and development, as well as wear and tear ; for it is the nitrogenous elements of food which replace the destruction of the nitrogenous tissues, such as muscles and nerves, and which also supply the material for their growth and development. The hydro-carbons furnish the material for the generation of animal heat, and, in addition, originate force.

Nature, in her wisdom, has arranged for the supply of an abundance of nitrogenous food for the infant, in what may be regarded as the standard type of food for those who are growing, by providing an excess of animal, or nitrogenous, food in milk, in the form of casein. The infant during its first year of life, while living on milk

only, adds about seven inches to its height. This result is more than double the maximum amount which is reached in the year of largest growth, and is treble the amount attained during the usual years of growth.

Nature always arranges for this herself whenever she is left unfettered, and thus has indicated the line along which we ought to proceed. In the *development* of the chicken in the egg from the germ—prior to its birth—nature recognizes the necessity of an excess of albumen, and provides double the amount of nitrogenous food that is required, after development, for the process of *growth* alone. For example, the constituents of the EGG, which are consumed in the development of the chicken, comprise roughly, two-thirds of albumen, represented by the white, and one-third of fat, or carbo-hydrates, which forms the yolk of the egg. After *development is completed*, and when *growth* alone has to be provided for, as exemplified in MILK, which may be taken as the standard food for *growth* in contradistinction to *development*, the

proportions are reversed—one-third of caseine, or nitrogenous food, and two-thirds of carbohydrates in the form of fat and sugar.

Hence the reason why milk is so excellent a food for those in process of growth, and why it should constitute the chief form of animal food during infancy and childhood, and ought also to be given largely during youth ; while, on the other hand, it is less suitable for those who have completed their growth, in adult age, by reason of this very excess of albuminous material.

Manhood.—In the ADULT the maintenance of health demands that all the kinds of food—albuminous, fatty, sugar, and farinaceous, with vegetables and salines—should be provided in varying proportions, according to the constitution of the individual, and the work performed. But much less of all kinds is necessary than in growing youth, since, when completeness of growth has been reached, the only food thenceforth essential is that required to supply the loss entailed by wear and tear.

Where an excess of hydro-carbons, such as fat, sugar, farinaceous food, and alcohol, is supplied in manhood, Nature, in her retribution, stores it up mostly on the surface of the body in the form of obesity ; while, if the excess be in nitrogenous compounds, such as animal food, she endeavours to remove the surplus in the form of lithic acid, but with the frequent supervention of gout.

Old Age.—With the exception of early infancy, at no time of life are greater errors in diet committed than during the period of OLD AGE. He who is nearing the borders, or is already within the verge, of old age, scarcely likes to recognize the fact, and continues therefore to live as an *adult*, forgetting that organs which were then in full vigour, and thus demanded ample sustenance, and were competent to digest what was required of them, now require that attention should rather be devoted to avoiding work of which they are no longer capable. The aged forget too, that as years increase, food should not merely be lessened in quantity, but also

softened in quality, or otherwise the system will become overloaded with fuel, which will only smoke, and not burn. If this fact be neglected, their digestive and assimilative powers become clogged, and feebleness ensues in consequence of inability to depurate the blood. Instead of checking their diet, and, by a little more air and exercise, enabling the fuel to be burnt up, they, feeling weak, increase it in the form of dainties, while the real fact is that the appetite has failed in consequence of an existing excess of food, such as beef-tea,—and the concentrated meat-essences, which are so injurious under such circumstances,—port-wine, etc. This condition continues until illness is caused, which happily arrests the feeding process for a time.

The diet of old age should resemble that of childhood, or even that which I have assigned to the third period of infancy. It should be in the same proportion, and similar in quality, but of course in larger quantities, viz. a little animal food, much farinaceous food, and milk.

If these food-epochs of life were better

observed, there would be less disease, and death would be postponed to a later period.

“A man loves the meat in his youth
That he cannot endure in his age.”

The age when each stage of life changes from one food-period to another must vary in each individual, and the variation depends upon the *hereditary predisposition*, as exemplified in the natural health, strength, and physique, as well as the climate and surroundings, the circumstances and occupations, and the regularity or irregularity of habits.

It is not only true that “what is one man’s meat is another’s poison”; but the same is applicable to age, that “what is one AGE’S poison is another’s meat.”

The diet which concerns us now, and of which alone I shall here treat, is the diet which is necessary for the *highest development of YOUTH*.

The Type of Diet.—The type of diet required for the youthful period of life is embodied in the two fundamental rules—

1. That a larger quantity of all the essential

kinds of food is required than at any other time of life.

2. That the main indication is, that a relative excess of nitrogenous food is imperative, if the highest state of growth and development is to be attained.

If we roughly represent the proportion of the various items of diet required at each stage of life, in diagrammatic form, on the basis of some arbitrary standard figure (say, Unity), we see at a glance the suggested idea which it is desired to convey ; thus—

TABLE of arbitrary proportions for the various kinds of foods at each epoch of life—

Epochs.	Milk.	Sugar and Farinaceous.	Animal.	Fat.	Vegetable.	Water.	Alcohol.
Infancy—							
1st Period.....	1'0						
2nd Period...	1'0	1'0					
3rd Period ...	1'0	1'0	0'5				
Childhood	1'0	2'0	1'0	0'5	1'0		
Youth	1'0	1'0	2'0	1'0	1'0	1'0	
Manhood	1'0	1'0	1'0	1'0	1'0	1'0	1'0
Old Age	1'0	1'0	0'5	0'5	1'0	1'0	1'0

III.

THE SPECIAL FOOD NECESSARY FOR YOUTH.

IT will be apparent that the food necessary for the first three stages of life is totally different from that which is requisite for the two latter epochs.

The difference consists in this—that in the former, the material required has to provide for the growth and development of the body as well as to replace the wear and tear incidental to the processes of life ; while in the latter, only sufficient is required to restore the wear and tear, and the less addition that is made to the body the better, as it is simply so much extra and unnecessary weight.

In order to supply the demands of the system during youth, an excess in *quantity* of all kinds

of foods is essential, as well as an excess of a certain *quality*.

In her typical food for the rapid growth and development of the young, as exemplified in the egg, and in milk, she has arranged, as I have shown, for about twice as much albuminous, or nitrogenous, material as is requisite to afford ample nourishment for those who have attained their normal size; part of this is required for the waste engendered by the ordinary wear and tear of living, and part of it for supplying the necessary food for growth in height and weight.

Owing, therefore, to this abundance of nitrogenous material, eggs and milk, when given in any large quantity, in addition to meat, are unsuitable as a staple diet for the adult; for it is easy at this stage of life to give an excess of nitrogenous material, and thus generate disease.

In the feeding of the young, from infancy to adult age, it is, therefore, important to remember this fact, that a plentiful supply of albuminous or nitrogenous food is imperative—at the order

of Nature—so that they may not be stinted in what is necessary to prevent them being stunted.

It is only when this fundamental fact is fully recognized that injustice will cease to be done in the rearing of the young at school, with the avoidance of irreparable mischief, which, unless so checked, will increase with years.

It is a well-established truth, which it is impossible for me now to discuss, that those who are, by necessity, stinted during growth, are, age for age, shorter and lighter than those who have been amply supplied with the requisites for attaining the highest standard of growth and development of the human frame. For those who are thus brought up are as diverse in their physique from those who are stinted, whether from necessity or ignorance, as are the well-cared-for plants, shrubs, and trees of the skilled nurseryman as compared with those which have only obtained deficient nourishment from an unsuitable soil.

I would only add generally that, in insisting upon this appropriate quantitative and

qualitative diet for youth, I am throughout assuming that regular daily exercise is concurrently enforced.

Upon the "loafer" in boys' schools, and upon girls in schools where no regular daily exercise is organized, a moral and physical wrong would be entailed were they allowed a full quantity of nitrogenous food. In these cases a bread-and-butter breakfast would be amply sufficient. But I would insist that both loafers, and girls' schools also in which regular and efficient exercise is not provided for, should be altogether removed.

Youth, then, whose chief function consists in growing—that is, in appropriating a relative excess of nitrogenous matter to form a daily addition to the body—requires that the nitrogenous food should be in considerable excess in proportion to the carbonaceous. But when manhood is reached, when force and heat have to be developed by the combustion of the carbonaceous food, the system can no longer endure an excess of nitrogenous material without the generation of disease.

Milk may, therefore, be regarded as the typical essential standard diet for those who are growing. So important an item is it in this relation, that Dr. Ferguson, a factory inspector, after a careful continuous measurement of factory children, came to the conclusion that between thirteen and sixteen years of age the growth was nearly four times as fast on milk for breakfast and supper as on tea and coffee.

IV.

THE PURCHASE OF FOOD FOR SCHOOLS.

THE purchase of food for schools is a difficult and a delicate question, but it is one on which the welfare of the young greatly depends, and consequently demands our regard.

Whether schools be fed by the trustees, governing bodies, or by masters and their wives, whether they be well-to-do or poor, the one principle must prevail, that sufficient *variety* of food is essential ; whereas at most schools, if not at all, too much sameness and routine prevail.

This defect arises from want of thought and trouble, rather than from necessity. The fault lies mainly with the purchaser ; for if he will seek more variety in his purchasing capacity, as well as in the cooking and serving capacity, the remedy will soon be found.

There are first class, second class, and third class schools, varying mainly, but not entirely, according to the quality of the boarding and tuition, and the fees that are charged. I say "not entirely," because some schools exist where a first class fare is charged for, but where the fare is anything but first class. While there are second class schools which, by good management, under able masters, and conscientious, careful caterers, who know how to avoid waste, are, in all essential particulars, first class, and where the fees are moderate. For it by no means follows, although it is the rule, that where high fees are charged more is spent upon the pupils than in those schools where the terms are much more moderate, and from which they derive the entire benefit of their payments. Much depends upon the disposition and conscience of each individual master ; and while all may be equally generously disposed, with some it is towards themselves, rather than towards the pupils under their charge.

Now, that to which parents have a right, that

which they can reasonably demand, and moreover that which is beneficial to youth, is this—that the food purchased shall be good, plain, wholesome, varied, and sufficient in quantity to satisfy the varying appetites. The purchaser should feel disgraced when sour bread, sour milk, rank butter, and tainted meat are placed on the table. I would even go further, and ask in how many schools does he take the trouble to see that the meat supplied to his school is really *tender*, and fit for the stomachs of the young?

But the further right exists—that all the pupils should be treated alike in their feeding, and that the best joints and the tit-bits should be fairly distributed. Where this cannot be done, the smaller children should have the preference rather than the elder ones, who know full well how to take care of themselves.

For instance, it is impossible for the purchaser to buy always the prime joints of meat, nor is this necessary. He must buy ribs and rounds of beef as well as sirloins; and he must take his share of loins and shoulders, as well as legs, of

mutton. Of course it is a pity that cattle are not made entirely of sirloin, and sheep of legs and kidneys! It is not fair that any one table, or any privileged class, or the elder pupils, should always have the sirloins and legs; but every table and every set of boys are entitled to a variety of food, and should have the privilege of any choice food in rotation.

Even at the risk of being tedious, I would repeat that plain and wholesome food is essential for youth, and were this principle adhered to in the vacations, as well as in term-time, there would be less discontent with school food, fewer attacks of indigestion, and better work would be done. For there are few things that cause more bad work, from dulness and listlessness, than indigestion. But even plain food, however good it may be, requires to be varied so as not to nauseate the stomach.

The purchaser of the school food should strive to provide suitable meals every day with reference to variety of appetite and constitution. In most schools there is always more than one

dish supplied, and the purchaser should endeavour to provide the substantial meat and pudding for the strong and hearty boy, while he should arrange for lighter meat and pudding for those who are delicate or have delicate appetites. This is one of the reasons why I maintain so repeatedly that the smaller and more delicate boy should always be served first. If this is not done it must always happen that the strong big boys obtain the best, and the smaller ones get only what they can.

For *delicate stomachs* I would advise, Give them time! The sufferers would eat well if they were afforded the opportunity of eating slowly, and were permitted a reasonable time for digestion. Delicate stomachs cannot do two things at once; while they are digesting, work or play must be in abeyance.

Yet at school, hurry is generally permanent. Boys are let out from school late, and it is undignified to remain in hall at meals, after those who commenced early have finished. In this way boys not only get a cold meal, but the best

pieces have been consumed, and the bolting of the little food they are permitted to obtain is alone possible.

At another meal the quick-eaters,—or, as I should rather describe them, the “canine bolters,”—have it all their own way again, and the poor slow-eaters put up with an insufficient meal.

At one school, with which I am acquainted, whenever there were *rissoles*, which were particularly well made and served, the big boys always ate them all, until the master observed their destination, and served from below upwards. I have heard, too, of the potato-dishes being cleared out by the elder, without leaving any for the younger, boys.

The question that I, therefore, now raise is this: Do these *delicate* boys, and I should like to add, the *small boys* also, obtain their due at school?

Let us investigate the matter. Of the fees that are paid for board, lodging, and supervision at school, irrespective of tuition fees, about one-fourth are applied to feeding, one-fourth to

lodging, and one-half appertains to the supervision of the master. In some few schools, I admit that each item will be represented by a third, rather than by the preceding apportionment; and, in a considerable number, a fifth would be nearer the mark for board, and another fifth for lodging.

Now, for this half of the boarding-house fees, do the delicate and small boys get "value received" in respect of the supervision that is necessary? In some schools, beyond all question, Yes! But in the majority of schools I unhesitatingly answer, No! For example, how many masters recognize it as part of their duty to see that the small and delicate boys obtain a comparatively hot meal, or are served first, or are allowed sufficient time for eating? How many masters see that the little boys are permitted to take part in school-games? And how many masters ensure that the boys committed to their care during the most critical time of their lives have sufficient *sleep*? Discuss the last question with any master, and, with the few brilliant

exceptions who actively feel their responsibility, it will be ascertained that the younger boys do not obtain adequate sleep. And it will be found that rectification in no degree follows the admission of the fault. Competition appears to be too keen for most schools to devote adequate attention to the supreme question of health; and thus wrongs, never to be rectified, are committed for lack of strength of character, and thoughtful persistence of effort.

V.

THE COOKING OF FOOD AT SCHOOL.

ONE of the drawbacks of civilization, if it be one, is that it has converted the human being into an animal, which is greatly dependent for its health upon the appropriate cooking of its food.

The machinery provided by nature for the mastication, deglutition, digestion, and assimilation of food is insufficient in our present stage of civilization. Our food requires to be efficiently cooked, if health is to be enjoyed and disease avoided.

Hence "the cook" has become a most important functionary in every household, and in none more so than in schools.

Efficient cooking is more important at this epoch than at any other period of life. In

childhood and *old age* the food is mostly light, and where this is not the case it is mechanically reduced by the knife, in lieu of mastication, before being eaten. This is not always so, for one illustrious octogenarian is said to have masticated his meat thirty-two times before swallowing it, which is perhaps one of the main reasons why he enjoyed his marvellous mental and bodily vigour. The *adult*, however, has generally learnt the art and comfort of careful mastication, having been taught its necessity by the stern and inexorable master, experience. In *youth*, on the other hand, the mechanism and importance of mastication are mostly ignored, and the food, after the canine custom, is practically bolted, more or less in solid lumps, whether it be meat or bread. In addition to which, the teeth, at this period of life, rarely receive the attention they deserve, and which would amply repay a systematic inspection and rectification, in present utility and comfort, and in preservation for the future. Hence the importance of good cooking for youth.

Without such cooking, indigestion and constipation or diarrhœa result, and a vast amount of strength is wasted in the efforts of Nature to overcome the difficulties placed upon her, while the force thus spent should be expended in brain-work or in muscular exercise.

But not only are present discomfort and loss of power occasioned, but often the delicate organs are permanently damaged, and the individual becomes a victim for life to indigestion and its attendant discomforts. This not only arises partly from bad cooking and hurried meals, but also depends upon the folly of parents in supplying too much pocket-money, to be spent injudiciously at the pastrycook's. This is an unwise arrangement, for if the pupils are well fed these purchases are injurious, while, if they are ill fed, it would be much wiser to send them good staple food, such as fresh eggs, instead of the trashy food which they are apt to purchase for themselves.

In those, again, who are delicate, and suffer from deficient nutrition, the extra labour thrown

upon the organs, which imperfect cooking entails, is likely to aid the development of hereditary disease, which by more careful cooking might be obviated.

The importance of providing a good cook in boarding-schools is, therefore, one not to be lightly regarded. Her work, too, needs constant daily supervision, so that the meat shall not be cooked hard and overdone ; that it shall not be blue-red from being underdone ; that the vegetables shall be thoroughly cleaned and cooked ; that eggs shall not be boiled hard ; and that a hundred other details which make food pleasant or unpleasant, digestible or indigestible, should be observed. Moreover, it is not sufficient that the food should be sometimes well cooked, and sometimes indifferently : it is essential that it should be uniformly well cooked. Any inferior cook can occasionally cook well by chance ; the good cook is the one who uniformly cooks well.

The best test of a cook is the simplest one. Can she boil an egg properly, and can she regularly cook a joint of meat and vegetables as

they should be cooked? If she can cook these simple things uniformly well she is invaluable, and can master all the further details of cooking with ease. The inferior cook is the very common one, who one day boils the egg hard, next day it is scarcely warm through, and consequently is full of that non-appetizing "slobber;" or one day the meat is done to a chip, and next day it is in that horrible condition, blue-red in colour and flabby in consistence. One day the potatoes are sodden, and the next they cut like raw apples; or the green vegetables are either sodden and floating in green water, or a cabbage caterpillar is found, or a slug, or a mouthful of grit gets between the teeth from imperfect washing.

I, therefore, again insist that the best cook is the one who can cook the simplest everyday things evenly well, and she should command a really good salary. Her eggs are always cooked to a second; the meat tender, easy to masticate, and easy to digest; the potatoes so floury that it is difficult to realize that they have been cooked

in water ; the greens always clean, dry, and free from insects and dirt ; the milk, though boiled, is never burnt ; her tarts are not sodden one day, nor do they resemble charcoal the next ; the porridge is never burnt, and never are the granules hard in the centre, but uniformly soft and digestive throughout ; and the tea is not made into a decoction of tannin.

In the cooking of vegetables thorough and prolonged boiling is required. There is one other item which makes or mars a dinner, and which greatly depends upon the skill of the cook—the *gravy*, which should either be the natural gravy of the meat itself, or as nearly resemble it as possible. It should not consist of fat, nor should it be flour and water mixed together.

Moreover, the good cook sees herself that the plates and dishes are hot and clean.

Roasting is the best way of preparing meat for table. The heat should be great at first, so as to coagulate the albumen of the meat on the outside, in order that the juice of the meat may

be retained. Later, the heat should be less, so as to roast gradually through. The meats supplied at school require a quarter of an hour for each pound, to be thoroughly cooked. If this time is not given, it is either underdone if cooked by a slow fire, or if it be hastened by a fierce fire it is scorched on the outside while it is raw within.

In *boiling* a joint of meat, the heat should be kept up to boiling-point for five or six minutes, so as to coagulate the outside of the meat, in order that its goodness may be retained inside. Then it should be cooled down by the addition of three pints of cold water for each gallon of boiling water, and retained at that heat, viz. about 170° Fahr., throughout the cooking.

In making *soups* the boiling should be slow, and with a low temperature, from the commencement—about 170° Fahr., which extracts all the goodness from the meat. The meat from which soups are made should never be eaten, for it is incapable of digestion, and should not afford any nourishment. Soup made at a low temperature

is never strong, stiff, and gluey: when it is in this condition, it has been made at a high temperature, which extracts the innutritious gelatine, fifty per cent. of which is incapable of digestion. Soup for youth should be always made with vegetables, even if they are strained off, as it makes a more nourishing fluid for those who are rarely good vegetable-eaters. Unless this is done, fruit should be largely supplied to the young, as this is the only way in which the vegetable salts, so necessary for nutrition, will be partaken.

The cause of most of the bad cooking at school arises from inadequate assistance in the kitchen; so that the cook, however able and conscientious she may be, has literally insufficient time at her disposal to fulfil her duties. The fault thus lies, not in the quality of the school-cook, but in a deficiency of kitchenmaids provided for her.

VI.

THE EATING OF FOOD.

I. MEALS.

IN eating food we place it by various means in our mouth, where it is more or less ground down into pulp by the aid of the teeth, and submitted to the action of the saliva. It is then swallowed, and all personal control over it is lost. Nature does the rest, and converts the food into blood, the foundation of life.

The method in which the necessary food-supply is taken by human beings in a state of civilization is by adopting certain stated times, which are termed MEALS. The more regular and punctual these meals are, the better is the state of health engendered. If this rule be not kept, the system at one time goes too long without food, and, at another, fresh food is passed into the stomach before the previous meal has passed

out of it, thus seriously incommoding that long-suffering organ.

There is a salutary rule, applicable to adult life, that each individual should rise from the table hungry. But this rule should not apply to youth, for the digestive process is much quicker, and the demands upon the stomach for the supply of food are great, so that the only rule here applicable is that the young should never leave the table until the appetite is satisfied.

Meals vary much in different countries. In schools a certain plan is required in order that all may be properly fed. Without such a plan the same process takes place which one sees in the feeding of animals. The strong and the bold get well fed, and the modest and the weak suffer. It is the master's province so to arrange all the details of the meals that this injustice cannot occur.

The following principles should be aimed at:—

1. That the meals shall be so equitably divided, that at no part of the day shall the body be stinted in its supply.

2. That the main food-supply shall take place in the early part of the day, at breakfast and at the midday dinner, when the digestive organs are most vigorous, and food is most required for work ; not when they are tired. And also that stimulating articles of food shall not be supplied in the evening, in order to prevent the animal instinct, so powerful in the young, being excited at bedtime, and to secure quiet and refreshing sleep, without the disturbance of dreams, sleep-talking, and sleep-walking.

3. That there shall be time to eat the meal, and masticate it thoroughly, without bolting. The slow eaters should be encouraged in their habit rather than hurried, the slowness being necessary for nutrition and the avoidance of indigestion. The non-observance of this rule is so frequently the cause of indigestion, that the youth gradually acquires a natural loathing for his food.

4. That masters shall, as I have already advised, have their meals with their pupils. They should have movable seats, and never

sit twice in the same place, so that no servant or pupil should know where they will sit on any given day. In this way they can see that the meal is well served, and the appliances are clean.

Nothing can take the place of personal supervision. Good servants are of inestimable value—in fact, I think that even the best of them rarely receive the due credit of their value to both masters and mistresses. Still, they have not that sense of personal responsibility which every master bears, or should bear, in order that no boy, forgotten or uncared for amongst the many, may be wronged while under his charge.

5. That there ought not to be an upper table, but that all should partake of the same food. If it is not good enough for the masters, it is not appropriate for their pupils.

6. That in serving the meals, the youngest and weakest should be served first, as they take longer to eat the food.

7. That at dinner the carver should have the potatoes at his side, and as he serves the meat he should, on each plate, place the potatoes

before it is handed to the recipient. The second vegetable, whatever it may be, must be handed round to each boy, as tastes differ so considerably.

8. That the master should personally observe that the knives, forks, spoons, plates, glasses, table-cloth, and the hands of the waiters are clean.

9. That the meals are served hot.

10. That the meat is well carved in slices, and not torn in shreds, or cut in lumps: to ensure this, the only requisites are common care and a sharp carving-knife. That it is tender, and neither underdone, overdone, nor tainted.

11. That every meal should be served punctually, and that no pupil should ever be detained in school when he should be at his meals. It is not fair to send him to a cold meal, nor is it right to expose him to opprobrious names through remaining in the dining-hall after others have finished, which must be the case unless he bolts his food or leaves it. Work

means waste ; and no work is possible without the consumption of a corresponding amount of material, or the individual himself wastes. If the pupil be defrauded of the material which is necessary for carrying out the work the master requires of him, it becomes simply an instance of the old Egyptian story of being compelled to make bricks without straw.

The brain can only be kept in the highest state of efficiency when the bodily functions attain the highest state of health ; and the bodily functions can only act at their best when they are supplied with appropriate food and exercise.

In the case of girls at school, according to the custom now in fashion, the greatest amount of work is sought to be obtained from their brains, with the least amount of exercise that is possible from their bodies. Consequently they continually break down, and sometimes are incapacitated for life—physical wrecks, the victims of hysteria and other neuroses. This is the fault, not of themselves, but of those who should know

better. The remark is often made, that it is *only* hysteria from which a specified girl is suffering. But why is she suffering? Simply because her teachers and her friends get her to do the impossible. If we are to have a higher education of girls (which is their due, and of which they are quite capable) without disastrous results, they must not be mentally pressed during the active years of growth, for all their nervous force is required for this development. During these years they need plenty of exercise, more food (and of the right kind) than they at present receive, more rest, and less work. Under these conditions girls, as well as boys, can work hard with impunity.

II. MEAL-TIMES.

The question of the hours for eating is one of the first importance to scholars, but especially to growing girls. One would have thought, with our long experience, that this vital matter had been settled with approximate completeness.

Yet in many schools these hours could not be more unwisely apportioned.

The food required during the twenty-four hours should be distributed in the following manner :—

1. *Before Breakfast.*—Most schools have an early lesson before breakfast, and no master or mistress, boy or girl, should attend it without previously taking food. From this rule there should be no deviation, for the practice of commencing work without some nourishment, is a most unnecessary trial to the constitution ; and in cold weather the omission is answerable for many colds and coughs, and much needless debility.

It is not enough for the master to provide the food ; it is essential that he shall personally see that no youth, under any pretext, ever goes into school at this time without it. If he *cannot* take it, we have evidence that he is not well ; he should then be handed over to the doctor. A master who fails to attend to this point, seriously fails in duty to his charge. That boys

should be allowed to rise so late that they have not the necessary minutes to take this food, and even finish their toilet while running to school, is a monstrous proceeding. It is not permitted at any other meals ; why should it be allowed here, when it is more deleterious than at any other time ?

This meal should be taken at 6.50 a.m. or 7.20 a.m., according as the early chapel and lesson occurs at 7 or 7.30 a.m.

Some day, I expect, we shall be more reasonable in the treatment of children at school, and shall permit them to have their breakfast in comfort before the commencement of the daily task !

2. *Breakfast.*—This should be served hot, as soon as the first lesson is over, and should not be served until all the pupils are out of school, so that all may sit down together.

There should be a sufficient interval after breakfast, before work is resumed, to enable *every* boy to obtain his “ natural relief ” without hurry, for on this his health greatly depends.

This meal should be provided by the school authorities, as indeed should all school meals. Such relics of the past as boys purchasing their own breakfasts and teas, and their own tea, sugar, and other necessities, should be absolutely forbidden. Time should be allowed to the slow eaters, so that they may have a thoroughly good meal.

It should be somebody's business at every meal, as I have already said, to note any boy who does not eat, and when the meal is over, to make careful inquiry into the reason. In this way only can a school be properly fed, and just complaints avoided.

In respect of the youth who cannot eat the meals provided for him, one or other of these conditions has happened :—

(1) He has eaten food on his own account—which should never be permitted, for it is almost invariably improper food.

(2) He is ill—in which case he should be sent to the doctor.

(3) The food is too rough, or too monotonous,

for a delicate stomach—in which case other food, such as milk at breakfast, or soup at dinner, should be substituted. On no account should such a boy be permitted to go without food from day to day, as is frequently the case, without investigation.

It is the duty of the caterer to ascertain the defect conscientiously ; for it is his business to see both to the health, and also to the growth, of his pupils. And neither health nor growth can be ensured without regular meals of appropriate food—appropriate not only to the age and size, but also to the constitution.

I repeat, I regard it as a grave dereliction of duty if a master fails to make himself acquainted with the case of every boy who refuses to eat any meal during the day. The parent pays for the meals, and the duty of the caterer does not cease when he has provided them ; it is imperative on him to know every boy who cannot eat his food, and to guard against the recurrence. A parent always does this at home, and the master, who is *in loco parentis*, should similarly

act. Whereas, in most schools, the maxim which seems to prevail is, EAT IT, OR LEAVE IT, whichever you please, and there is an end of it.

3. *Dinner.*—In most schools breakfast takes place at from 8 to 8.30 a.m., and in this case the dinner-hour should be fixed not later than 1 to 1.30 p.m. If it be later, lunch should be provided, as the interval is too long for the young to be without food.

In many schools, where a boy is delicate or a poor feeder, milk (which is exactly suitable and sustaining to growing children) is supplied to him at 11.30 a.m. This is preferable to soup, and to those highly fashionable, but deleterious, concentrated meat juices.

This meal is the most difficult one to serve properly, where a large number has to be provided for. It tests the efficiency of the caterer more than any other meal, and shows whether he is a good organizer, and capable of carrying out minute details for the good of all, especially the weak, under his care. For if dinner at school is to be a pleasant and enjoyable meal, it is

necessary that the dinner-table should be nicely laid, that the meal should be punctual, that it should be served hot, that the waiters should be sufficient in number to prevent its getting cold during the service, and that the carvers should be well skilled in carving, in order that the meat may look appetizing and be eaten with relish. There can be no two opinions on this point,—that a poor dinner, well cooked, hot, and promptly served, is far more appetizing and palatable than an elaborate dinner imperfectly cooked, lukewarm, and indifferently carved and served.

These are minute details, perhaps—life is made up of them—but they make all the difference whether the meal is to be *enjoyed* by the strong, or whether it is to be left *untouched* by the delicate or fastidious.

I think the school dinner would be eaten with a greater relish, and with fewer complaints, if the exceedingly injudicious plan of permitting boys and girls to read at meal-times were altogether abolished. The custom doubtless

originated in the best intentions, and it fulfils these intentions admirably, but with this pernicious result: that a boy who has brought an interesting book to the table, either entirely forgets his dinner, which, becoming cold, is rendered distasteful, or so dawdles over it that he finds every one has finished and is withdrawing from the dining-hall, and hence must leave a portion of his meal. It is the old story that no one can effectively do two things at once.

I have frequently heard of the meat at school being tainted so that it cannot, and should not, be eaten. This is a grave scandal. In this country it is not once in five years that this condition ever need occur on account of the heat. Whenever it occurs, another dinner should be immediately provided, and served as soon as it is cooked. If, from local conditions, this is not feasible, the dinner should be served at tea-time. The more trouble given to all concerned the better, for this result would prevent a recurrence. Anyway, the scholar

should not be permitted to go dinnerless for the day. But the main fault lies with the cook, for she knew, or ought to have known, that the meat was tainted, and ought to have refused to cook it, and immediately obtained another supply.

4. *Tea*.—This meal should take place at 6 p.m. It should be a good substantial meal of unstimulating food, and every boy should be encouraged to eat freely. At present, it is a very scanty meal, and hurriedly swallowed, at most schools ; whereas it should be a good meal at all schools, and should be supplied by the school authorities. It might be a varied meal, never consisting of more than one article, and never the same on two consecutive days. Such articles of diet as the following would be appropriate : egg, dried fish, anchovy paste, potted meat, cake, jam, marmalade, honey, radishes, and lettuces.

There are a few delicate boys who may daily require, owing to their very poor appetites, some extra food at this meal, such as an egg,

fish, or occasionally even a cutlet, and it should not be denied them.

5. *Supper.*—This is usually provided from 9 to 9.30 p.m., and consists of various stimulating articles of food and drink, comprising meat, tart, cheese, and beer, varying considerably at schools. Now, although I have urged that the period of youth requires a large amount of food, and especially a large excess of nitrogenous food, I cannot too emphatically insist that this should never be provided at supper-time; and I would go further, and urge that it should rarely be provided after middle-day dinner. I cannot but regard this meal as a most injudicious one for boy and girl.

It is unwise, because it sends youth to bed with undigested food in the stomach, which engenders restless sleep, talking, walking, and uncomfortable, often terrifying, dreams. It is further unwise, because it is accountable for certain physical sensations in the young, which are better avoided, rousing their animal instinct often beyond their control.

I would, therefore, urge upon all principals of schools the propriety of abolishing the scanty tea at 6 p.m., and the stimulating supper at 9 p.m., and amalgamating the two meals into a single good one at 6 p.m., and allowing nothing afterwards. If, however, in the case of those who are bad feeders—the delicate, or those who are growing fast—something else is required, then I would recommend that, in winter, bread and milk, bread and butter, cocoa, or gruel, should be given; and, in summer, milk, and bread and butter, or milk and soda-water; but nothing else.

By adopting the plan which I suggest,—of a thorough good tea,—no boy would be deprived of any food through the two meals being combined into one, and every boy would lead a happier and healthier school-life, and masters would have much less care and anxiety; while many of the heart-rending sorrows incidental to school-life would be avoided. Is it not worth the trial? I defy any one to gainsay its utility for the purposes described. I would

with all earnestness endeavour to persuade those who have the purity of the young at heart to try the suggested scheme honestly, and I am confident that many a child will bless them for the help thus given.

VII.

THE VARIOUS ARTICLES OF FOOD REQUIRED FOR YOUTH AT SCHOOL.

THE great fault in most schools, where there is not a deficiency in quantity of food, is that there is too much sameness—a sameness of material and a sameness of cooking—whereas, even if the sameness of material were necessary, which I do not admit, a little more variety in cooking would obviate the difficulty to some extent, and make the food more appetizing.

The ingenuity of school-cooks should be encouraged ; for from the hard work they have, and the responsible position they hold, they should command good salaries, and parents and pupils expect, and are entitled to obtain, more variety in cooking and feeding. It only requires a little more forethought on the part of the

caterer; and it is precisely this which makes the difference between a good house-master and an indifferent one.

On the other hand, in some schools the food arrangements are everything that could be desired, and bear witness to the care and forethought expended, and furnish evidence, too, that the points upon which I am insisting are not beyond the capacity of *all* schools. The question seems to me to resolve itself into that of competence or incompetence for the work that is implicitly undertaken.

I do not ask that luxuries should be supplied to youth at school; the boys are better without them. But I do insist again, here, that boys have a right to plenty of food, of the appropriate kind for growth and development, which shall be cooked and served in an appetizing way; and not the "short commons," cooked and served in the rough-and-ready Gothic fashion, and often accompanied by the assertion that anything is good enough for boys. It seems to be forgotten that these boys are being moulded into the

future men of the nation ; that every effort should therefore be used to enable them to attain their highest state of perfection in growth and development ; and that every endeavour should be made to ensure the provision of strong digestive organs (without which no degree of strength can be attained), rather than the derangement of these organs for life, with its attendant miseries, through improper or insufficient food during the years of growth.

What a mighty number of sufferers have traced the origin of delicacy of stomach to insufficient food, or hard fare, at school ! Whether rightly or wrongly I cannot pretend, in general, to say. But, at any rate, their school-feeding has left a very vivid impression on memory for life,—so vivid that they have assigned to it both cause and effect.

On the other hand, I am pleased to say that there are, and have been, schools where the young have spent the happiest and healthiest days of their lives,—days that are looked back upon with indescribable pleasure. Why do not parents

find out these schools and shun the others? Simply because they do not take the trouble.

I. NATURAL CRAVINGS.

Before discussing the various articles of diet, I should like to premise a few words upon the likes and dislikes of youth, as exemplified in their *Natural Cravings*. One feature in life is common to all human beings, namely, that no two persons are alike in appearance, in gait, in character, in temper, in appetites, and in mental and physical capacity. Amid the similarity that appertains to human beings there is infinite diversity. No matter in what aspect human nature be regarded, this diversity is present.

In no instance is this Law of Nature more strongly manifested than in the likes and dislikes to which I have referred. The old proverb is absolutely true, that what is one man's meat is another's poison. It is, therefore, incumbent on school authorities to endeavour to study the individual peculiarities of those who are committed to their charge.

The likes and dislikes of the young in the matter of food are very powerful, and while they should not be encouraged, allowance should be wisely made for them. The greatest cruelty is still practised by parents and teachers in forcing on children that to which their system has an inveterate repugnance ; and, on the other hand, refusing them that which their system really requires, as evidenced by the legitimate preference they show.

It would seem as though adults failed to recognize that the “natural appetites” of the human being vary according to age, and what is cared for at one period of life is not relished, and is even loathed, at another.

Some children cannot mentally digest classics, and physically cannot digest fats or starches ; even the sight of fat in any form will prevent them eating. Yet they are forced to partake of both. If, regarding these aptitudes and disaptitudes, they were only allowed to digest science mentally and sugar physically, those cruel battles would cease. Nature is not allowed a

voice in the matter, but disastrous and ignorant meddling prevents and thwarts her at every turn. Natural cravings should be watched and satisfied, so that Nature, in her reasonable demands, may work at her best. I have even known children steal money in order to purchase sweets, simply to satisfy Nature's demands, which had been thwarted by stinting in sugar at the table at home.

It is a general rule that children like sweets and detest fats. And children crave for the pastrycook's delicacies mainly because those who provide their food, for some inexplicable reason, deny them the food which their system demands. When will it be learnt that, in the training of the young, Nature's laws must be observed? The case is mainly one of instinct. If children are to be developed in the highest form, they must be encouraged to eat what they most relish. They are not all cast in the same mould, and cannot all be passed through the same mill either in work, play, or feeding.

In discussing the various articles of food

required in the feeding of the young, I propose to consider briefly the several types of diet, using single instances to exemplify a type.

II. THE VARIOUS ARTICLES OF DIET.

I. *Bread*.—Bread is made from wheaten flour, and is the staple form of food in this country amongst all classes, and all ages, except infancy, and can be varied from day to day with great benefit. It can be made from finely ground “whole meal” or, as is the usual custom, from “white flour.” It will be seen, from the accompanying table, that the former course is the more nourishing for the young:—

Wheaten flour.	Water.	Nitrogenous substances.	Fat.	Starch.	Woody fibre.	Mineral matters.
Whole meal	14·0	21·8	1·2	59·7	1·7	1·6
White flour	16·5	12·0	1·2	69·6	—	0·7

Inasmuch, however, as some of the nitrogenous substances in whole-meal flour are not capable

of assimilation, it is not, in fact, so much more nourishing as it appears. Still, whole-meal bread is undoubtedly better suited for the nutrition of youth than bread made from white flour, on account of its larger quantity of nitrogenous substances and mineral matters, which children require so largely in the formation of bones and teeth.

As much bread as a child can eat should always be provided by the master. The crust is twenty-five per cent. more nourishing than the crumb ; and butter should be given when it is eaten alone, for the purpose of making it a staple food, as bread contains little fat of itself. I would also urge on masters, who have pupils to feed, the constant necessity of seeing that the bread be wholesome ; for while one batch may be sound in every respect, the next may be either sour or musty, and not only uneatable—except under the stern necessity of hunger—but positively harmful.

No one ever tires of bread, even though it may be always made in the same way. This

probably arises from its unmarked taste, resembling water, as well as from the great variety of its components. But it would be eaten with still greater relish if it were varied from time to time between white, brown, and whole-meal breads. Also the size, the shape, and the general appearance of the loaf have their virtues in assisting the appetite.

It is bread that, together with the various farinaceous foods, supplies the main bulk of starch to the system, which is essential to all but infants for nutrition.

2. *Sugar*.—No growing youth should be stinted in sugar, or sugar-forming food, such as starch; it is essential as his chief heat-forming food, and preferable to and more digestible than fat, though at the same time the presence of fat in the diet is a prime element of health. Moreover, sugar provides one of the most urgent necessities of the nascent brain. It is, also, a most important food for muscular tissue, enabling more work to be done, and increased growth accomplished. It is more digestible

in its crude state, than when combined with various articles of diet, such as jam, sweets, etc.

3. *Fat*.—Fat, in some form, is an absolute necessity in the diet of the young. But they require it in less quantity than sugar and starch. Some children, at certain periods of their lives, seem to have an instinctive dislike to every kind of fat, especially if they are tired ; while at other times the same children will eat it with avidity. What state of the system it is which compels this preference or repugnance, is not clear. The best forms in which it can be supplied are milk, butter, the fat of meat, bacon, and especially suet puddings, for children will eat the latter when they will not touch the fat of meat. In cold weather they should always be freely supplied with as much fat, in some form, as they will take ; while in hot weather the fat-supply must be diminished and the starchy food increased.

4. *Milk*.—Milk is the grand type of all diets, consisting as it does of albuminous, oily, saccharine, saline, and watery principles. A standard

diet will contain some or all of these constituents in various proportions.

Milk should, therefore, always be bountifully supplied for all adolescents, as an essential, and part of their staple diet.

As milk has been shown to be a fertile cause and communicator of disease in communities, the greatest care should be exercised in the selection of the supply for all great schools; and while one scarcely likes to advise anything that may seem to interfere with the freedom of the master in the choice of his purveyors, yet I cannot but think that greater safety would be found in obtaining the supply of milk from the school's private dairy, or from one large farmer, whose farmyard, cattle, and dairy should be under the supervision of the medical adviser to the school: in this way greater care would be exercised by the farmer, not only by reason of the medical supervision, but also on the ground that the propagation of disease from his dairy would mean, at all events, temporary financial ruin. I am aware of the argument, that where

the milk-supply is obtained from several sources a part only of the school would be affected, in case of milk-poisoning, instead of the whole ; nevertheless I maintain that the risk is more than proportionately increased where there are several possible centres of poison.

It has been repeatedly proved, that between the cow's udder and the human stomach the milk may be so poisoned as to cause death to the recipient. Not only so, but it is a question, recently proved, that disease in the cow itself is propagated directly to the consumer.

It should also be remembered that the milk, termed *colustrum*, secreted immediately after calving, will frequently cause diarrhœa and vomiting in the young. I have seen severe illness occur from the supply of such milk.

In a paper read by Mr. Ernest Hart before the Social Science Congress in the autumn of 1883, he recorded eighty-three milk *epidemics*, representing 5000 *cases of disease*, and 580 *deaths* in about ten *years*.

I am convinced that milk epidemics could be

sensibly diminished, if a certain custom, now prevalent at dairy farms, were abolished, and another plan adopted in its stead.

All farms in the country obtain their water supply from a well, which is situated almost invariably in the neighbourhood of the farm-yard ; and we are all familiar with a farmyard as a receptacle for manure. Some time since I scoured the neighbourhood round Rugby to discover a farm where this condition did not exist, and I failed.

The custom to which I refer, and which I wish remedied,—I have succeeded in remedying it in three farms in which I am interested,—is this : the milk-cans after use are scoured out well with boiling water, and then rinsed thoroughly with cold well-water. Now, how many wells, situated as I have described, can be guaranteed to be free from farmyard pollution ?

The only safe plan, therefore, is to reverse this order of things. Scour the cans out thoroughly with cold water, then rinse or scour them with boiling water as thoroughly as possible, and

let them dry without a subsequent rinsing with cold water, for, if the well be contaminated, the danger lies here.

Milk epidemics deeply concern all schools, and if every reader of this volume would persuade his own dairyman to adopt this course, the saving of many lives, and the prevention of a large amount of illness, would be the happy result.

In unhealthy seasons, and whenever infectious illness is epidemic, milk should always be boiled before consumption. So frequent is the illness arising from the consumption of milk, that there are strong grounds for urging further, that no milk should be drunk until it has been boiled, even although its nourishing value is thereby diminished.

For it is proved that tuberculosis, scarlet fever, diphtheria, typhoid fever, not to mention other possible diseases which may be disseminated by means of the milk of cows, have arisen from milk-drinking. It is difficult to conceive a more perfect solution for the development of germs than is provided by milk,—one germ

falling into such a fluid producing millions after its kind in a few hours.

The boiling would also obviate a great and frequent evil by preventing *sour milk* being given at schools, which can only arise from the grossest negligence on the part of the caterer. For most boarding schools are situated in the country, and cows are always milked twice a day: there is, therefore, absolutely no excuse for the milk becoming sour. In fact, this condition can only arise from the exceedingly pernicious practice of the morning milk being saved until tea-time, and the afternoon milk being kept until breakfast-time.

The composition of cow's milk is shown in the following table:—

Cow's Milk.	Water.	Casein and albumen.	Milk fat.	Milk sugar.	Ash.
	86·87	4·65	3·50	4·28	0·70

It might tend to ensure a constant supply of genuine milk if every school possessed a lactometer, with which the specific gravity of the

milk could be tested from time to time. The specific gravity of average good milk is 1032, but if very rich in fat it may only be 1028, and the specific gravity is also diminished if water be added.

5. *Meat.* — Some schoolmasters, physicians, and moralists hold that youth should be allowed meat only once a day. With this I agree in respect of those who have not commenced rapid growth, provided they drink milk instead of tea and coffee; for the average public-school boy, I do not think the rule is sufficient. The latter requires meat twice a day during the years of active growth; and for girls the rule is equally necessary. It will be admitted that, with a view to producing the highest state of health in the adult, meat once a day is at all events essential to cover wear and tear. If that be true, I maintain that a boy needs meat *once* a day also to provide for *his* wear and tear, which is far more active than it is in the adult; and, I would add, he requires meat a *second* time to supply the means for growth. The meat should be

given at breakfast and at midday dinner, and on no account in the after part of the day.

If we will only observe Nature, we shall see that she provides in milk—the natural food for rapid growth—an excess of nitrogenous matter, which is, consequently, unsuitable as a staple diet for the adult. But the young animal cannot do without this excess, since he has to provide for growing, and this means that he has to cumulate the excess of nitrogenous matter in the form of a daily addition to the body. In fact, the growing boy needs a large “income” in the shape of food, part of which he expends as “current cash,” but a large proportion he lays by as “capital,” to invest in growing; whereas the adult can spend all his “income” as “current cash.” The latter may, perhaps, wisely keep a small reserve on “deposit” in case of a sudden “demand” for increased expenditure of force; but, after making this prudent provision, he should on no account capitalize a further sum in the form of corpulence or gout.

By meat, I do not mean butcher's meat only,

but I include all that class of nitrogenous food—meat food, as distinguished from farinaceous food—which comprises fish, bacon, sausages, eggs, etc., with which the school breakfast is sometimes varied.

The composition of meat, free from fat, consists of—

Meat.	Water.	Nitrogenous substances.	Fat.	Mineral water.
	76·0	21·5	1·5	1·0

If meat be cooked in the way I have suggested under the head of “Cooking,” the gravy, when it is cut, gushes out in a stream; while, if not cooked aright, it is quite dry when cut, as there is no gravy to ooze out.

As I consider the matter to be of grave importance, I would repeat that it is a scandal that tainted meat should ever appear on the table at schools. When it is tainted the fact is known before it is cooked: *then* is the time and the duty to reject it, and procure a fresh supply.

My impression is that in schools where tainted

meat, or meat that is not tender, is given, the reason will generally be found to be that the meat, which varies enormously in price from time to time, is supplied by contract at the lowest possible price per annum. "When I asked an ironmaster," says Emerson, "concerning the slag and cinder in railroad iron, his answer was, 'There is always good iron to be had. If there was cinder in the iron, it was because there was cinder in the pay.'"

If this is not the case, the gravest neglect on the part of the caterer then exists.

If, however, my impression be correct, as I imagine it is, then the sooner the contract system ceases, the better for the pupils and the character of the school. For where high fees are paid by parents to ensure good food, it is most objectionable that the caterer should contract at the lowest price that can be forced upon the tradesman. Is it likely that a butcher will supply good tender meat, and in good condition, at a minimum price? Of course, if the price goes against him, he purchases an inferior quality,

or sends good meat which has become tainted, which he knows his ordinary customers would not tolerate. I would advise all customers to shun professedly philanthropic tradesmen, for it is not in human nature to trade consciously at a loss. I sometimes even hear people boast that they can purchase a given article at a certain price, when I know that the genuine article could not be produced or obtained for the money.

In our large public schools, and in the high-class private schools, to which I refer in this treatise, where the boarding fees are ample, "tinned meats," "Australian meat," and "New Zealand frozen meats" should never be supplied. These meats are excellent in their way, and are a most valuable source of food for this country ; but high fees should command good English meat, honestly supplied. Parents pay for the first-class fare, and their children should in honesty receive it.

6. *Soups*.—In winter soup should be supplied at least twice a week, not so much on account

of the meat-juices it contains, but for the sake of the vegetables. When green vegetables are scarce, and little else can be obtained except cabbages, to which children are not partial, sufficient vegetable salts are not otherwise obtainable for the requirements of health. It would be well if every school had a Papin's Digester, by means of which bones can be boiled under high pressure, and the whole of the animal matter thus extracted. In this way there is always a soup-stock ready, and with very little additional meat, such as sheep's head or bullock's kidney, together with judicious flavouring, an excellent soup is made at very little cost. Soups are always nourishing for the young, and should be supplied all the year round, except perhaps in the hottest weather; but even at this season white soups are wholesome. These soups should not be strong meat soups, which are neither requisite nor wholesome.

7. *Fish*.—Fish should form a much larger item in the diet of youth than has hitherto

been the case, as it is a valuable food. But, in saying this, I do not advocate the incessant repetition, for this is wholly bad management, of the same fish, cooked and served at the same meal, and in the same fashion day after day; for it merely nauseates and disgusts the stomach, however wholesome it may be.

It contains about 95 per cent. of fibrine and 5 per cent. of fat; that is to say, it contains more fibrine and less fat than meat itself, with the exception of salmon, which contains 78 per cent. of fibrine to 22 per cent. of fat, and of eels, where the percentages are respectively 44 and 56.

Fish, in point of nutriment, compares favourably with meat, and, in some cases, in point of price. In our insular position it is a disgrace to us that fish is so dear. The costliness of fish does not arise from any dearth of fish or of fishermen; for tons are caught which are utilized simply as manure. The costliness arises from the difficulty and expense of transit, which Englishmen are so slow to

organize. Surely, if our colonists can send us meat over several thousands of miles, we ought to be able, with despatch and cheapness, to transfer our fish inland from our coasts. Where wages cannot rise, the same effect, in respect of rendering the wages effective, can be produced by cheapening food. This could be readily accomplished, in connection with our fish-supply, by organizing cheap and rapid transit, and establishing markets freely in various centres throughout the country.

8. *Vegetables*.—The staple vegetable in this country is the potato; and it is the one of greatest value to the young because they *will* eat it, and because it can be served in so great a variety of forms. If it be treated in a certain way, its value is increased both to the buyer and the consumer. An ingenious machine has been invented for washing and brushing potatoes, which is so excellent and economical that, where used, it saves its cost several times over. After its employment the potatoes can be boiled in their “jackets,” which are perfectly

clean and wholesome, and the valuable salts are less lost in boiling, though if cooked by steam none are lost.

Vegetables, especially green vegetables, are a necessity for ensuring health ; but, as a rule, the young will not eat them in the autumn and winter, when cabbages are the prevailing "greens ;" eczema consequently appears every autumn and winter.

On one occasion, when some boys in some houses were allowed as much meat as they could possibly eat, a serious amount of eczema occurred, so that I was compelled to check the supply, and thus eradicated the ailment ; while in other houses, where this practice had not been allowed,—the meat being carved for the boys, and the quantity being accordingly limited,—the eczema did not appear. I do not believe the complaint depended so much upon the animal food being excessive, as upon the disproportionate ratio between the animal and vegetable food ; the cause lay in the relative excess. The boys did not, and would not, eat

enough vegetable food to counteract the excess; and thus, on a large scale, there resulted what I see every winter, as soon as the cold weather begins, when boys refuse vegetables. Vegetable *salts* are essential to health; they are absent from none of the tissues. They occur in the form of carbonates, lactates, phosphates, etc., of lime, magnesia, potash, soda, iron, etc. Without them, malnutrition arises in the form of general ill-health and scurvy.

In order to try and overcome the dislike of the young to vegetables, it is necessary to supply a sufficient variety. They are not above eating asparagus, peas, and French beans; but these are not always obtainable, and their price, if they were, would prohibit their constant use. But even green vegetables can be varied; and if more attention were paid to their cooking and serving, they would be more frequently eaten, especially if those in authority would from time to time impress their value upon the pupils under their charge. Let me relate what once happened to a school under my medical

care. I had occasion to press upon a school-master the importance of the boys eating vegetables, and I asked him to speak to his pupils on the subject. He did so, and plentifully supplied the green vegetables in ten dishes. Not long after, I had occasion to investigate the question again, and I found that no other vegetables than potatoes were provided. On inquiry, the following facts were ascertained. At first the boys partook of the vegetables freely. Then one dish went back to the kitchen untouched, and the cook consequently only provided nine. Next day two were returned uneaten, and the cook naturally provided less, until all of them were returned untouched; and thus the cook, not liking to see the waste, failed to send any more to table.

Vegetables, to be wholesome, should be as fresh as possible; and in the case of boarding-schools which are situated in the country, as all boarding-schools ought to be, this is easily arranged.

In winter, when vegetables are scarce, beet-

root served cold with vinegar forms an excellent vegetable, as well as cauliflower served cold with vinegar in the same way. Salads, too, in their season, should be plentifully supplied.

9. *Fruits*.—These are greatly relished by all children, indicating a constitutional necessity for them as an article of diet. They are cheap, and might be provided, cooked or uncooked, more frequently than they are as an article of school diet. Until this becomes a rule, boys should be encouraged to spend some of their pocket-money at the fruiterer's as well as at the pastry-cook's.

Fruit should not be eaten in the evening, as it then continually disagrees with young people.

10. *Table-salt*.—Salt enters largely into all the animal tissues, and indeed to such an extent, that a natural craving for it exists in the human system. Animals also travel great distances to obtain it; and wild animals become a sure prey to the hunter who conceals himself in the neighbourhood of a salt spring.

It is an essential to the constitution of the blood, the lymph, and the chyle, and forms a large proportion of the salts of the body. As a matter of fact, fifty-seven per cent. of the saline matter of the blood consists of common salt; and as this is largely eliminated daily by the excreting organs, the necessity of a constant supply is obvious.

Yet little attention is devoted to the subject, and no effort is made to induce the young to partake of it at their meals.

This arises mainly through the neglect of parents in teaching their children early the necessity of its use. It is simply placed on the table at most meals, both at home and at school, but no persuasion is employed to induce its use. Were a little more attention bestowed upon the subject, the food would be more easily digested, and the tissues better nourished. Both its absence and its excess tend to create a general *malaise*.

11. *Pastry*.—I often hear and read of complaints about badness of food at schools,

especially at dinner. At our public schools, and at our best private schools, I believe this charge is, as a rule, untrue ; for the masters buy—and see that it is supplied—the same quality of food for the boys as for themselves. At the average school, too, I believe the feeding is vastly better than it was even a few years ago. But the provision of the very best food that can be purchased is not everything in the feeding of the young. There is wanted, in addition, an abolition of the sameness, and an improvement in the cooking and serving, of the food. In order that this may be effected, more thought, more skill, and more conscientious supervision are necessary, rather than the expenditure of more money. But there is one item which is still far from what is desirable—I mean the pastry and puddings supplied at dinner-time. As a rule, there is too much sameness and too much insipidity ; whereas there could be, and should be, an endless variety of tasty puddings suitable for the young. I have recently heard of a high-class school which furnished stewed prunes one

day as the pudding for dinner, each boy receiving three on his plate ! Where such meanness exists complaints ought to be made, and parents and their children should complain a little louder ; and, if redress cannot be obtained in any other way, let it be secured by reason of importunity.

Farinaceous puddings are excellent for young children and for old people, but those passing through youth and manhood do not care to eat them every day. Nothing can be more wholesome and suitable for youth than such puddings ; but even variety in these is imperative. Moreover, the cost of puddings is not great, and they are much appreciated by the palate of youth ; and if the pudding on one day is cheap, the next may be a little more expensive, and, when an average is struck, the daily pastry will be found an inexpensive item.

It is a libel on boys to say that they do not like, and will not eat, puddings. They are keen enough to get them when they are not the proverbial school puddings. One schoolmaster

whom I know, who is anxious to feed his boys well, and to supply a due proportion of carbohydrates, and to avoid an excess of nitrogenous food, never tastes a pudding anywhere, which he likes, but he obtains its receipt. He has thus a fresh pudding for nearly every dinner in term, and he assures me that his boys usually take two "helpings." In seeking to ascertain his boys' likes and dislikes, he continually varies his dinners. Sometimes he gives them meat and pudding: at others soup, fish, and pudding: at others soup, fish, and cheese. He found that whenever he omitted the pudding the boys always resented it.

It is expedient for masters to take the elder boys into their confidence whenever they propose a radical alteration. For, if one or two of the elder boys—the "swells"—refuse a dish, it is tabooed by the whole, and remains untasted. Such is "society" fashion even amongst boys!

12. *Cheese*.—As a rule, cheese is supplied at most schools, but it is given at the wrong period

of the day. It is most injudicious to give cheese to the young for supper at 9 p.m., and then send them to bed at 10 p.m. It upsets their digestive organs, makes them restless in the night, and results in unrefreshing sleep.

Cheese is most wholesome for the young if given at dinner-time. There are some who dislike meat, and eat very little at dinner, in consequence, to whom a morsel of cheese would be invaluable, especially any of the cheeses made from good rich milk, such as Stilton, Double Gloucester, Roquefort, Gorgonzola, Cheshire, and Cheddar.

The composition of the latter, for instance, is—

Cheddar Cheese.	Water.	Casein and albumen.	Fat.	Ash.
	27·83	44·47	24·04	3·66

It will be seen, therefore, that a very small quantity contains a very large amount of nourishment. In fact, while meat contains 15 per cent. of nitrogenous food, and peas and beans about

22 per cent., cheese itself has more than 30 per cent., and some cheeses, such as those I have specified, much more. Moreover, the casein is remarkable for the large quantity of phosphate of lime which it is capable of holding bound up with it, and the tenacity with which the phosphate is retained.

It is well, therefore, to bear the fact in mind that there is a larger amount of nitrogenous food in a pound of peas, still more in a pound of cheese, than in a pound of beef.

13. *Alcohol at School.*—The question of supplying alcohol to youth at school is one that demands most earnest thought in considering their training. Very strongly, indeed, do I hold that no alcohol should be given to the young, in any form or at any time, except as a remedy for sickness.

With many parents the prevailing feeling appears to be, that the question of proper feeding at school is comparatively secondary, if their child can only obtain his wine or stout twice a day. This is their panacea for every

ailment, for every constitutional delicacy, and even for any deficiency of food. Yet, without doubt, alcohol is detrimental to the young, both immediately and remotely, and should be absolutely omitted from their diet.

The immediate effect of alcohol upon them is a diminution of will-power, and at the same time an excitation of animal instinct. To many of the young this animal instinct, under the conditions of our present civilization, is very troublesome even without a stimulus, while, under the influence of a stimulus, it tends to pass beyond control.

At the present time, beer is usually supplied at school at dinner and supper, for those who desire it. If its use is to be continued at all, it should be taken at dinner only. It is happily, however, used less now than formerly, and the milk which is generally substituted is, on the other hand, a very important item in the growing child's diet.

This question is too large for discussion in this book. I have already considered it fully else-

where ;¹ and I would ask the earnest co-operation of doctors, parents, masters, and governing bodies in endeavouring to remove alcohol, in all forms, from the school dietary.

14. *Tea, Coffee, and Cocoa.*—These drinks, which are supplied at breakfast and tea-time, should be varied as much as possible, sometimes one being given and sometimes another. Or they may be varied thus: cocoa being given before early lesson, coffee at breakfast, and tea at tea-time. This would be an excellent arrangement for the elder boys at public schools. The younger boys at private schools would thrive much better, as I have shown, if they always had milk alone to drink. Even skim-milk is very wholesome, and far superior to tea for the young.

15. *Water.*—The quantity of fluid of all kinds that is required by the system every twenty-four

¹ “The Preservation of Health, as it is affected by Personal Habits, such as Cleanliness, Temperance, etc.” The Essay on Social Statistics, awarded the Howard Medal of the Royal Statistical Society of London for 1884.

“On the Impropriety of the Use of Alcohol in Schools.” C.E.T.S. Publication Dépôt, Westminster, London, S.W.

hours ranges from forty to fifty ounces, *i.e.* two pints to two pints and a half, in addition to that which all food contains to the extent of about two pints. If the exercise taken entail considerable action of the skin in the form of sweating, then more is required to supply the place of the fluid thereby lost.

School authorities would confer a great boon in respect of the health of youth, and effect it at a trifling cost, if they would provide filters at several handy places where boys, during school-hours—and during a game—could quench their thirst. This provision would prevent them from being thirsty for several hours, and would obviate their resorting to shops to quench it by gulping down a large quantity of iced drink, which has a deleterious effect upon them. The latter course is injurious to all animal life. For instance, what can be worse for horses, especially hunters, than to have a bucketful of water night and morning, and none at other times? Under Nature's urgency they are obliged to drink it, for they know that they must have the

quantity, and that no other opportunity will occur. My own horses are never without water, day or night, and as they know that it is always at hand they never drink a large quantity at any time, but take a sip whenever they require it.

The best filters for this purpose are the "Pasteur-Chamberland" and the "Berkefeld" Filters. They should be placed where they will be unaffected by frost.

16. *Pastrycooks*.—Most young people have what is called a "sweet tooth." To them sweets of all kinds are the most toothsome of all the foods they eat. This arises from the need of the system for this form of carbonaceous food. And Nature prefers it in this form, and can thus deal with it in the most effective way, although some wiseacres think they know better than Nature, and strive to teach her what she ought to prefer. When will human beings be modest enough, as Bacon says, to follow Nature, instead of idly and injuriously trying to lead her?

But, although I admit all this, I am bound

to add that these secretly bought dainties are a constant cause of ill health at school, arising more from the fault of parents and of school authorities, than from the pastrycook's delicacies.

I have pointed out that it is natural for the young to desire these delicacies, and there are many children of riper years who are still able to relish them with a great amount of pleasure. But the latter are content to partake of them at legitimate hours only ; whereas youth at school desire them, and partake of them, at any odd time, and the odder the time the greater the enjoyment obtained. A sniff of the pastrycook's aromas or a sight of his delicacies whets the appetite for them—"makes the mouth water ;" and if any pocket-money remains, the consequence is certain. The desire having arisen, satisfaction is the only course that occurs to them. A call for the aid of the virtue of self-restraint rarely arises.

To prevent these indiscriminate visits to the pastrycook, with the consequence of uneaten meals, and the absence, thus produced, of suffi-

cient appropriate material for growth and development, a certain definite system is imperative.

When parents hear complaints about the feeding at schools, they should first ask themselves if they are the chief cause. Without a doubt, schools are sometimes at fault on this food-question, as I have endeavoured to point out. But more often the parents themselves are the wrong-doers, and the remedy for complaints is that parents should cease to supply so much pocket-money, and so many hampers, generally full of most unwholesome articles of diet.

At other times, when boys complain of food, it is the system of the school which is at fault. I have already stated that masters should closely watch their boys at dinner, and that any boy who cannot eat with a relish is either ill, or in trouble, or has visited the pastrycook, or possesses a hamper.

In most cases, the boy who cannot eat his dinner naturally writes home and complains to his parents of the way in which he is fed. Now,

the usual reason why he cannot eat is, that he has not long left the "sock-shop," where he has had "a high old time." I would ask, Is there any reasonable being in the world—even a boy—who could sit down to meat and potatoes, soon after visiting the "tuck-shop," without failing to eat, and thus finding fault with the quality or the cooking of the food? I, therefore, repeat, that the fault rests with the school authorities. If they cannot by persuasion and by precept induce youth to exercise sufficient self-restraint to abstain from the "tuck-shops" until after their meals, then every reasonable being will support me when I urge that the "sock-shops" should be out of bounds for at least two hours and a half before dinner. By all means let them visit the pastrycook *after* any or all of their meals, and between 10 and 11 a.m. for a bun, sponge cake, or biscuits; but for their stomach's sake, for their health's sake, and for their growth's sake, insist that they shall not wilfully set aside the staple food which is essential for their growth and development. If

school discipline is not to be exercised in such matters, I do not understand the use of school discipline, or where it could be more legitimately enforced.

But, in one word, I wish it to be understood, that a plan exists which furnishes *the* remedy for preventing this extensive and injurious patronage of the pastrycooks. It consists in giving them enough to eat at regular meals of suitable food, properly cooked, and sufficiently varied in kind, and to supply an ample variety of "sweets" at tea-time. In this way the whole system becomes satisfied, and the craving for the pastrycook's luxuries dies a natural death.

Until this is done, and in order to ensure the regular meals being eaten, either the pastrycook's should be, as I have already said, out of bounds for at least two hours and a half before meals, or the school authorities should get the influential boys to refrain from visits at those hours, and so discountenance it. For boys are like sheep: if one goes to the shambles, they all go; if none go, the rest refrain.

I do not hold with masters, as I have often heard them boast, preventing the young from getting their fruits and sweets at the pastry-cook's, while they fail to supply them sufficiently at meal-times. It is not the pastrycook's luxuries which do harm ; it is their illegitimate use. Boys need these articles, and should not be forbidden them ; they only require guiding or compelling in the proper channel. They should be taught to enjoy what is thus pleasant and wholesome at proper times, and in moderation, avoiding greediness. But Nature's laws are inexorable, and she provides a remedy for excess. For the boy soon begins—

“To loathe the taste of sweetness whereof a little
More than a little is by much too much.”

It would also be advisable to instil into them, that it is loathsome to eat until they make themselves ill. Some boys do not appear to possess this sense of propriety. There are others who are so constituted that they cannot partake of any but the plainest food without being sick and ill. Yet they have not sufficient

strength of character to resist the temptation. They should be taught that it is as greedy to eat what they know will disagree with them, as it is to eat too much.

At schools where ample food, sufficiently varied, especially in the sweets, is provided, boys will, by virtue of this fact alone, largely eschew the "sock-shops."

For it is the snacks between meals which not only excite indigestion, but also create a craving in the stomach, which during school-life may be satisfied by the pastrycook's luxuries, but which, after school-days are ended, causes a desire for morning and afternoon stimulants. This is seen mostly in our cities, where mere boys are not content with their meals, but must "have a drink" whenever they can find, or make, the opportunity.

All these habits have a beginning, and the cause of the beginning arises as often from internal sensations as from external temptation: the sensation is there, and the temptation finds the soil ripe for its action.

The remedy, therefore, is plenty of variety at the school-table, in order to allay the craving for snacks at the pastrycook's between meals. It is *not* the remedy to debar the young from sweet things.

17. *Hampers*.—What I have said under the head of the pastrycook, largely applies also to the question of hampers. It is the same thing supplied by the parents instead of the pastrycook. Where a youth is well fed at school, hampers are wholly unnecessary, and do nothing but harm ; but where the food is not appropriate in quality, and is deficient in quantity, parents have a right to supplement the food-supply for their children, rather than let them suffer. But they should see that the hamper only contains articles of *food* which are necessary for the purposes of growth. In such a case, however, the remedy for deficient food is not the hamper from home, but removal to another school.

It is also of no avail that masters should provide excellent food, well cooked and well served, if boys are detained in school at meal-

times, so that either the meal is cold, or insufficient time is allowed for eating. This is a crying evil with which head-masters ought to deal with a strong hand; for the lazy or the naughty boy requires his meals quite as much as the industrious or the good boy. This course should, therefore, never be permitted under any circumstances. There are many devices that can be resorted to as a punishment; whereas the deprivation of food, or uncomfortable meals, which is the same thing, is not the remedy which should be employed. It is simply a sign of the forgetfulness or the incompetence of those in authority.

VIII.

THE RESPECTIVE VALUES OF SUNDRY ARTICLES OF FOOD.

THE value of a food to the young depends greatly upon the quantity that can be utilized by the system, and the amount that passes out of the system undigested, as waste. For if only half the amount that is eaten is capable

	Parts digested of 100 parts of the perfectly dried solid.	Amount of solid food, residue passing away from the body by the alimentary canal.
Sugar.....	100'00	
Rice.....	96'00	4'00
Wheaten bread	95'00	5'00
Roast meat	94'80	5'20
Hard-boiled eggs.....	94'75	5'25
Milk and cheese in the proportion of 2'4 : 1 ..	94'00	6'00
Corn-flour.....	93'30	6'70
Milk	91'00	9'00
Potatoes	90'60	9'40
Carrots, celery, cabbage..	76'00	24'00
Peas, beans, etc.	52'40	47'60
Gelatine	50'00	50'00

of digestion and absorption, the labour entailed in the process is in excess of the value received. It will be seen, from the foregoing table, that some articles of food are nearly entirely assimilated, while in the case of others nearly half of what is eaten is waste and of no nutritive value.

It is also of great interest to all who are

TABLE showing the rapidity of digestion of various kinds of meats.

MEATS.	Time necessary for meat to be dissolved in the stomach.
	Hours.
Boiled pig's feet	1'00
Boiled tripe	1'00
Broiled venison	1'30
Boiled turkey	2'25
Roast goose	2'30
Roast sucking-pig	2'30
Broiled lamb	2'30
Fricasseed chicken	2'40
Boiled beef	2'45
Roast beef	3'00
Boiled mutton	3'00
Roast mutton	3'15
Fried beef	4'00
Boiled fowls	4'00
Roast fowls	4'00
Roast duck	4'00
Roast pork	5'15

concerned in the feeding of youth to know the digestibility of the various kinds of meat, which facts were ascertained by Dr. Beaumont, in his observations on a Canadian who had an open wound leading into his stomach, through which various foods were introduced, and withdrawn, as desired.

Dr. Beaumont further found that in the digestion of eggs much depended upon the cooking ; thus—

TABLE showing the rapidity of digestion of eggs according to the method of cooking.	
EGGS.	Time occupied in dissolving eggs in the stomach.
	Hours.
Eggs, whipped and diluted	1'30
„ fresh raw	2'00
„ fresh roasted	2'15
„ soft-boiled	3'00
„ poached	3'00
„ hard-boiled	3'30
„ fried	3'30

IX.

THE VARIOUS ARTICLES OF FOOD REQUIRED AT EACH MEAL AT SCHOOL.

AFTER what I have stated as to the requirements for the food of youth at school, and as a consequence of my complaint of the want of variety, or the monotony, of the food which prevails, with some noteworthy exceptions, at most schools, the question will naturally be asked by masters, What remedy I have to suggest for this condition of things, in order both to remove the legitimate complaints of parents, and to satisfy the physical requirements of youth during their growing years ?

The fastidious complainings, or fads, of boys and girls—especially of boys—I shall not even attempt to satisfy, as it is the natural privilege of human beings to grumble ; they are insatiable.

I will endeavour to answer the question in the clearest form by suggesting what I regard as equitable, from the provider to the recipient, in the form of a series of tables of diet, or *menus*, for each meal respectively. In this way there can be no misunderstanding.

1. *The Food required before Breakfast.*—This meal should be of the lightest, and should be given at those schools only, where there is chapel *and a lesson*, before breakfast, in order that the strength may be husbanded, and colds and chills avoided.

It should consist of a cup of cocoa, coffee, or hot milk, with a piece of bread and butter; no more is required, no more is beneficial, or otherwise the value of the breakfast, which follows an hour and a half afterwards, will be lost.

2. *The Food required at Breakfast.*—This meal should be one of the best, if not *the* best, in the course of the day, and should be one of the principal school-meals, and not supplied as an “extra,” nor provided by the

parents, or the pupils themselves. It is preposterous that at *some* schools legitimate food should still have to be provided by parents as *extras* at any meal. Is it not still more preposterous that at *most* schools insufficient bed-clothing is provided, and parents have to supplement the serious deficiency in winter by sending blankets, rugs, or eider-down quilts, or the youths themselves must pile on their overcoats? There are some praiseworthy exceptions, I know, but they are so rare as to be noticeable. If one school can provide completely, why not all? Would such a system be tolerated anywhere but at school?

It is an absolutely indefensible school custom that the young should rise at 6.30 or 7.30 a.m. and have no good meal—in fact, nothing but bread and butter, with tea or coffee, until dinner at 1 or 1.30 p.m.

I know that it is very much the fashion with adults to eat very little until work is over in the evening, and then to have a very hearty meal not long before going to bed. It is miscalled

dinner ; it is in reality supper. But a similar treatment of the young, who have to work hard and play hard, as well as grow, is, beyond all question, extremely injudicious. Their system simply gets into physical debt every day of their lives. Youth requires its food-supply to be paid in advance, so that the system is always solvent, and may be provided with the materials of work and growth, without feeding on itself.

The morning school-work should, therefore, be preceded by a good substantial meal at breakfast : the afternoon school-work, or play, requires to be preceded by another substantial meal at dinner-time.

In the evening, when the system is tired, and less work is required, the meal should be lighter in character, though sufficient in quantity, so that it may be digested by bedtime.

On such lines, the health, strength, and growth of youth are certain, and on these lines alone. Better work, too, will be done, and refreshing rest and sleep obtained.

This substantial breakfast—an imperative condition—which is already provided in many of our best schools, and which ought to be the prevailing custom, should consist of the following articles of diet, and should be varied as much as possible from day to day and from week to week.

I. SOLIDS AND SEMI-SOLIDS.

Porridge.

Bread.

Hot rolls.

Butter, apportioned to each pupil by weight, so that the strong do not also secure the share of the weak.

Bacon, fried or boiled.

Fried bread.

Ham, cold boiled.

Tongue.

Ham and eggs.

Bacon and eggs.

Eggs—

Boiled.

Poached.

Buttered.

Fried.

Kidney and bacon.

Sausages.

Sausage-rolls.

Sausage-meat cakes.

Fresh fish, boiled, fried, or pickled—

Brill.

Cod.

Fresh fish, boiled, fried, or pickled (*continued*)—

Dory.
Flounders.
Haddock.
Hake.
Halibut.
Herrings.
Ling.
Mackerel.
Pilchards.
Plaice.
Salmon.
Shad.
Skate.
Smelts.
Sole.
Turbot.
Whiting.

Dried fish—

Haddocks.
Herrings.
Kipperd herrings.
Mackerel.

Cold meat—

Stuffed shoulder of mutton, boned.
Pressed beef.

Hot meat—

Mutton-chops.
Beef-steak.

Cold pies—

Pork-pie.
Rabbit.
Veal.
Steak.
Meat patties.

Brawn and veal-cake.

Ox-cheek jelly.

II. LIQUIDS.

Milk. This should be encouraged, rather than the use of tea, coffee, and cocoa.

Tea.

Coffee.

Cocoa.

In many schools porridge is not supplied, because it is supposed to require a long time for sufficiently cooking, although its wholesome character, especially for those still growing, is most marked. The difficulty, however, could be overcome if the oatmeal be put in soak overnight, for in this way it becomes softened through by the morning, and then twenty minutes' boiling before it is served is ample time for thorough cooking. Every boy should choose whether he will eat it with sugar or salt, and should have as much milk as he desires.

These articles may be varied in the following way, according to convenience ; according to the seasons, which also control the price and wholesomeness ; and according to the age and constitution of the youth.

I have arranged a breakfast diet table for a month, to provide a sufficient variety :—

TABLE of Suggested Variety of Diet for Meat
Breakfasts at School.

<i>First Week.</i>	
Sunday1	Sausages. (This breakfast should always be hot where the dinner, as is usually the case, is cold.)
Monday2	Dried fish. Hot rolls.
Tuesday3	Porridge. Tongue.
Wednesday . . .4	Pork-pie.
Thursday5	Porridge. Eggs, boiled.
Friday6	Pressed beef. Hot rolls.
Saturday7	Porridge. Stewed ox-kidney and fried bread.
<i>Second Week.</i>	
Sunday8	Broiled ham and eggs.
Monday9	Steak.
Tuesday10	Porridge. Fresh fish, hot, or cold and pickled.
Wednesday . .11	Cold ham. Hot rolls.
Thursday . . .12	Porridge. Dried fish.
Friday13	Sausage-meat cakes. Hot rolls.
Saturday . . .14	Porridge. Buttered eggs on toast.
<i>Third Week.</i>	
Sunday15	Mutton-chops.
Monday16	Brawn. Hot rolls.
Tuesday17	Porridge. Eggs and bacon.
Wednesday . .18	Dried fish.
Thursday . . .19	Porridge. Cold ham.
Friday20	Kedgerie. Hot rolls.
Saturday . . .21	Porridge. Tongue.
<i>Fourth Week.</i>	
Sunday22	Sausages.
Monday23	Ox-cheek jelly. Hot rolls.
Tuesday24	Porridge. Fresh fish.
Wednesday . .25	Steak.
Thursday . . .26	Porridge. Eggs, buttered.
Friday27	Tongue. Hot rolls.
Saturday . . .28	Pork-pie.

It will be noticed that on some days I have given the cook two articles to cook on the same morning, and on other mornings nothing at all. I regret this, but I do not see how to obviate it in all cases. For instance, on the mornings when porridge is cooked I have suggested that bacon, eggs, or fish should also be provided. This, I know, gives the cook additional work. On the other hand, she is only one person to consider, and it is her work, and when she has a good fire it is not much extra trouble to cook porridge and eggs, or porridge and bacon ; whereas it would be laying a burden upon the stomachs of many of the boys to supply porridge and meat-pie on the same morning. In the table I have, therefore, primarily considered the health of the pupils, and in doing so I have not inflicted a great hardship upon the cook ; while I have saved her some trouble, and the master some expense, by only requiring a large breakfast-cooking fire four times a week instead of seven.

None of the tables can be regarded as

actual working tables, for I am only able to suggest a variety for the whole year, whereas such tables require to be arranged for every month in the year. For instance, when eggs are plentiful, sausages and their like are not obtainable ; and when eggs are scarce, sausages and fish are plentiful. Every school, therefore, should have its " Breakfast Diet Table " printed in blank, so that it can be filled in according to the season and the place, and should then, when thus completed, be handed to the cook on the first of every month.

Though the tables are thus to an extent imperfect, they are adequately suggestive to enable sound working copies to be constructed on their basis.

I append a form * which I suggest as suitable for all boarding-schools, and filled in for the month of January.

* The *blank* Breakfast Diet Charts can be obtained from Mr. A. J. Lawrence, bookseller, Market Place, Rugby, printed on thick paper, and suitable in size for daily working, in sets for a year. Price 2s. per set.

BREAKFAST DIET TABLE FOR ——— SCHOOL.

January, 189....

Days.	Porridge.	Hot Rolls.	Eggs.	Salt Meat.	Fresh Meat.	Dried Fish.	Fresh Fish.	Meat Pies.	Brawn.
Sunday ...									
Monday...		Rolls		Tongue	Sausages	Haddock			
Tuesday...	Porridge			Bacon				Pork	
Wednesday	Porridge			Pressed beef					
Thursday .	Porridge	Rolls					Plaice		
Friday									
Saturday ..	Porridge								
Sunday ...			Eggs	Broiled ham					Ox- cheek
Monday...		Rolls							
Tuesday...	Porridge			Tongue	Sausage- meat cakes	Bloaters			
Wednesday	Porridge			Bacon					
Thursday..									
Friday		Rolls					Haddock		
Saturday ..	Porridge								

BREAKFAST DIET TABLE FOR ——— SCHOOL. — *Continued.*

January, 189....

Days.	Porridge.	Hot Rolls.	Eggs.	Salt Meat.	Fresh Meat.	Dried Fish.	Fresh Fish.	Meat Pies.	Brawn.
Sunday ...					Mutton- chops				Brawn
Monday ..		Rolls		Boiled ham, cold					
Tuesday ..	Porridge								
Wednesday					Stewed ox-kidneys	Haddock			
Thursday .	Porridge	Rolls		Tongue	and fried bread		Whiting		
Friday....									
Saturday..	Porridge								
Sunday ...		Rolls		Bacon and potatoes	Sausages				Veal- jelly
Monday ..									
Tuesday ..	Porridge				Steak				
Wednesday									
Thursday .	Porridge	Rolls					Codfish Pies	Rabbit	
Friday....									
Saturday..	Porridge					Kippers			

After perusal of this table of breakfasts, the remark that will naturally be made by some masters will be this: Some of the articles named are much too expensive to be supplied for a school-breakfast at the present rate of charges. This may be so in some schools, where the terms are low; but this treatise is, as I have already stated, mainly intended for the first-grade schools, and allowance must, therefore, be made for schools which are not included under this denomination.

I, further, reply, in the first place, that I do not ask, even in the first-grade schools, for anything that is not in season. In fact, food out of season is usually unwholesome. Any way, it would be unreasonable to expect schools to supply food that is out of season. But, when in season, fresh eggs can be obtained sixteen for a shilling, herrings twelve a shilling, mackerel three a shilling, and rabbits eighteenpence each.

In the next place, in considering the diet table, individual items should not be counted, but an average price of the whole should be taken.

It will then be seen that the Table is not at all an unreasonable one. And if the main article of raw material at one breakfast costs sixpence, it will more often cost fourpence, twopence, or even a penny, with an average of not more than threepence, which, with the additional cost of bread and butter, coffee, milk, and sugar, will not make the school-breakfast exorbitant in price.

3. *The Food required at Dinner.*—This meal is, and always has been, the best meal of the day at schools. It receives the greatest care and attention in providing, cooking, and serving, and it is usually served with punctuality.

In most schools it is a good meal, and sufficient in quantity : in some schools it is an excellent meal in every sense, and plentiful. The faults that occur are mainly these : that there is not sufficient variety in the character of the meal : that too often the food is bolted instead of being masticated ; and that it is no one's business to see that every youth eats a good dinner, so that boys often go for days without eating any

dinner at all. I lay emphasis on my oft-repeated statement, that it *should be* the responsible duty of some one to see that these faults do not exist.

I will now mention the various articles of food suggested for school-dinners. Of course, they will vary according to the seasons, and according to the character and situation of the school.

I. SOLIDS AND SEMI-SOLIDS.

- (a) *Soups.* Ox kidney.
Sheep's head.
Shin of beef.
Ox tail.
Ordinary meat-bones.
Lentil.
Pea.
Vegetable.
White-soups, such as artichcke, tapioca,
and vegetable marrow.
Tomato.
- (b) *Meats.* Beef—
Sirloin, roasted.
Ribbs.
Round.
Salt, boiled.
- Mutton—
Leg, roasted.
Leg, boiled.

Mutton (*continued*)—

Shoulder, roasted and onion-sauce.

Shoulder, boned and stuffed.

Lamb.

Roast veal—Shoulder, boned and stuffed.

Fillet.

Pork, roasted and boiled salt.

Hot pot, fresh meat.

Stewed steak, with vegetables.

Haricot mutton.

Irish stew.

Rissoles.

Curry.

Hash.

Liver and bacon.

Rabbits, stewed or boiled.

Hare, jugged.

Goose.

Steak pudding and pie.

(c) *Vegetables.* Artichokes.

Asparagus.

Beet, cold, as salad in winter.

Broad beans.

Broccoli.

Brussels sprouts.

Carrots.

Cauliflowers.

Celery, raw and stewed.

Cucumber.

French beans.

Green vegetables of all kinds.

Lettuce, as salad, and at tea-time.

Onions.

Parsnips.

Peas.

Potatoes, steamed, boiled, baked, fried, and mashed.

Radishes, at tea-time.

Spinach.

Tomatoes, as a salad.

Turnips.

Vegetable marrow.

Watercress.

(d) Puddings.

Pastry—

Fresh fruit tarts of all kinds in season.

Jam tarts and puffs.

Cheese cakes.

Mince pies.

Plain pastry cakes.

Apple dumplings.

Baked jam roll.

Baked treacle roll.

Baked mincemeat roll.

Baked plum pudding.

Boiled suet puddings—

Fresh fruit puddings of all kinds in season.

Boiled plum puddings, of various kinds.

Marmalade.

Ginger.

Gingerbread.

Lemon.

Fig.

Jam roll.

Plain suet roll, with jam or treacle.

Baked milk puddings—

Bread and butter.

Rice.

Tapioca.

Sago.

Vermicelli.

Semolina.

Cornflour.

Hominy.

Custard.

Sundry puddings—

Shapes of rice, with jam or treacle.

Shapes of cornflour, with jam or stewed fruit.

Shapes of hominy, with jam or stewed fruit.

Fruit jellies.

Castle puddings.

Cabinet pudding.

Apple charlotte.

Curds and whey.

Batter, boiled and baked.

Marmalade, baked.

Baked apples.

Stewed fruits of all kinds, fresh and evaporated.

Stewed rice or tapioca.

Pancakes.

Macaroni cheese.

(e) *Cheese.* Cheddar.

Gloucester.

American.

Canadian.

Dutch.

Gruyere.

II. LIQUIDS. Water.

I now offer as a guide, a table of dinner diet for a month :—

TABLE of Suggested Variety of Diet for Dinner at Schools.
JANUARY.

Sunday 1	Soup	Artichoke soup.
	Meat	Cold roast ribs of beef.
	Vegetables	Baked potatoes. Salads, pickles, or beetroot.
Monday 2	Puddings .	Mince pies. Boiled custards.
	Meat	Roast shoulder of mutton and onion sauce. Rissoles.
	Vegetables	Potatoes.
	Puddings .	Mould of cornflour, with jam. Baked apples.
Tuesday . . . 3	Cheese	
	Soup	Brown soup, with vegetables.
	Meat	Roast fillet of veal and boiled bacon. Boiled leg of mutton and caper sauce.
	Vegetables	Potatoes. Greens.
Wednesday . 4	Puddings .	Plum-pudding and sweet sauce.
	Meat	Roast sirloin of beef. Stewed or curried rabbits.
	Vegetables	Potatoes. Brussels sprouts.
	Puddings .	Stewed prunes. Macaroni cheese.
Thursday . . 5	Cheese . . .	
	Soup	Mutton-broth, with vegetables.
	Meat	Roast shoulder of mutton, stuffed. Hash.
	Vegetables	Potatoes. Greens.
Friday 6	Puddings .	Baked apple-dumplings or jam-tarts.
	Meat	Boiled salt beef. Steak pies.
	Vegetables	Potatoes. Carrots and greens.
	Puddings .	Cabinet pudding. Baked rice.
Saturday . . 7	Cheese . . .	
	Soup	Pea-soup.
	Meat	Roast leg of mutton. Irish stew.
	Vegetables	Potatoes. Parsnips.
	Puddings .	Boiled marmalade pudding.

APRIL.

Sunday 8	Meat Vegetables	Cold roast round of beef. Potatoes. Salads, pickles, or beetroot.
Monday 9	Puddings . . Cheese	Raisin pudding and custard sauce.
	Soup Meat	Tomato soup. Roast shoulder of veal, stuffed, and boiled ham. Hash.
Tuesday . . 10	Vegetables Puddings .	Potatoes. Cauliflower. Baked treacle-pudding.
	Meat Vegetables Puddings . Cheese	Roast ribs of beef. Minced veal. Potatoes. Green vegetables. Roly-poly jam-pudding. Tapioca.
Wednesday 11	Soup Meat	Thickened soup, with vegetables. Quarter of lamb and mint sauce. Stewed steak.
Thursday . 12	Vegetables Puddings .	Potatoes. Spinach. Baked batter pudding. Stewed rhubarb.
	Meat	Roast leg of mutton. Liver and bacon.
Friday 13	Vegetables Puddings .	Potatoes. Greens. Mould of hominy and jam. Baked currant pudding.
	Cheese Soup Meat	Clear soup. Roast loin of pork, stuffed. Rissoles.
Saturday . . 14	Vegetables Puddings .	Potatoes. Apple sauce. Lemon-pudding. Jam tarts.
	Meat	Roast shoulder of mutton. Steak pudding.
	Vegetables Puddings .	Potatoes. Onion sauce. Castle puddings and sauce.
	Cheese	Macaroni cheese.

JULY.		
Sunday ...15	Soup	Clear soup.
	Meat	Cold roast sirloin of beef.
	Vegetables	Potatoes. Salads, pickles, or cucumber.
	Puddings .	Fresh fruit-pies. Stewed tapioca.
Monday...16	Meat	Roast leg of mutton. Minced beef.
	Vegetables	Potatoes. Broccoli.
	Puddings .	Ginger-pudding. Fried - bread and jam.
	Cheese....	
Tuesday ..17	Meat	Quarter of lamb. Hash.
	Vegetables	Potatoes. Mint sauce. Peas.
	Puddings .	Baked custard. Jellies.
Wednesday 18	Meat	Roast ribs of beef. Boiled leg of mutton and caper sauce.
	Vegetables	Potatoes. Turnips and carrots. Cabbage.
	Puddings .	Stewed fruit. Baked raisin pudding.
	Cheese ...	
Thursday .19	Soup	Brown soup.
	Meat	Roast shoulder of veal, boned and stuffed. Boiled bacon. Rissoles.
	Vegetables	Potatoes. Cauliflower.
	Puddings .	Boiled treacle-pudding.
Friday20	Meat	Roast leg of mutton. Stewed steak.
	Vegetables	Potatoes. Cabbage.
	Puddings .	Stewed rhubarb. Cheese cakes.
	Cheese....	
Saturday ..21	Meat	Roast shoulder of mutton and onion sauce. Liver and bacon.
	Vegetables	Potatoes. Spinach.
	Puddings .	Fresh fruit-puddings. Baked rice.

OCTOBER.		
Sunday . . . 22	Meat	Cold roast round of beef.
	Vegetables	Potatoes. Salads, pickles, or beetroot.
	Puddings .	Plum-pudding and sweet sauce.
	Cheese . . .	
Monday . . . 23	Soup	Thickened soup, with vegetables.
	Meat	Roast loin of veal, stuffed.
		Boiled ham. Steak pies.
	Vegetables	Potatoes. Cabbage.
Tuesday . . 24	Puddings .	Baked marmalade pudding.
	Meat	Quarter of lamb. Shepherd's pie.
	Vegetables	Potatoes. French beans.
	Puddings .	Jam-tarts. Stewed fruit.
Wednesday 25	Cheese . . .	
	Soup	Vegetable-marrow soup.
	Meat	Roast leg of mutton. Stewed rabbits.
	Vegetables	Potatoes. Parsnips.
Thursday . . 26	Puddings .	Boiled treacle-pudding. Stewed rice.
	Meat	Roast sirloin of beef. Yorkshire pudding.
	Vegetables	Potatoes. Cauliflower.
	Puddings .	Fresh fruit-pies. Curds and whey.
Friday . . . 27	Cheese . . .	
	Soup	Clear soup.
	Meat	Boiled leg of mutton and parsley sauce. Rissoles.
	Vegetables	Potatoes. Greens. Mashed carrots.
Saturday . . 28	Puddings .	Apple Charlotte. Tapioca.
	Meat	Stewed steak. Roast shoulder of mutton.
	Vegetables	Potatoes. Greens.
	Puddings .	Bread-and-butter pudding. Boiled jam-roll.
	Cheese . . .	

The observations made in connection with the breakfasts apply here also, and I have shown on pages 149 and 150 a blank dinner-chart,* which can be varied every month of the year, and given to the cook on the first day of the month, filled in as desired by the principal.

It will be observed in my "Dinner Tables" for the month, that I have suggested the provision of soup and cheese on alternate days. This suggestion has met with such widespread remonstrance, that I must explain my meaning more clearly, and still more emphatically, for I bate no jot or tittle of my recommendation. The remonstrances arise on account of the *expense*: the *time consumed* in "getting through" such a dinner: and its constituting *too heavy* a meal. In reply, I would insist:—

1. That the expense, if any, should be borne.

* The *blank* Dinner Diet Charts can be obtained from Mr. A. J. Lawrence, bookseller, Market Place, Rugby, printed on thick paper, and suitable in size for daily working, in sets for a year. Price 2s. per set.

2. That if a little more time were occupied in the consumption of food, the gain in the health of the pupils would afford ample compensation.

3. In connection with the contention that an unduly heavy meal would be provided, it seems to have escaped observation that I have only suggested these additions for alternate days. I still insist upon them. But I never expected, or intended, that every boy would take soup and cheese. Those who have a taste for meat will shun the soup and cheese, and restrict themselves to their *pièce de résistance*. But what I do earnestly contend is, that those boys, of whom there are many in every school, to whom meat is more or less distasteful, should be provided with an alternative, such as I have suggested, instead of practically remaining dinnerless.

4. *The Food required at Tea.*—Here I refer the reader to what I have said on this subject on page 75. I will merely repeat myself sufficiently to make my views intelligible.

In my opinion, the very scanty tea at present

in vogue in most schools should be made a more substantial meal, and the rather heavy supper abolished. If these two meals be combined into one good meal at 6 p.m., boys will not suffer in their stomachs, nor masters in their pockets.

I, therefore, suggest that this meal should consist of the following articles, varied daily :—

I. SOLIDS AND SEMI-SOLIDS.

Eggs.

Fish.

Potted meat.

Anchovy paste.

Bread.

Butter, in pats for each pupil.

Jam, of all kinds.

Marmalade.

Honey.

Treacle.

Buns.

Cakes.

Radishes.

Lettuces.

Watercress.

II. LIQUIDS.

Milk.

Tea.

Coffee.

Cocoa.

5. *The Food required at Supper.*—The substantial supper, consisting of meat or cheese, and beer, which is the rule in many schools, should be abolished, and a substantial meat meal supplied at breakfast in its place.

The meagre tea and supper, as I have suggested, being amalgamated into a good substantial tea, at 6 p.m., of unstimulating food.

If supper is thought necessary, it should consist of bread and butter, and milk ; or bread and milk in winter, and milk and soda-water in summer. But every young person would be better without anything on going to bed, unless such delicacy of constitution exists that a good meal is never eaten, in which case food, little and often, is required.

I. SOLIDS AND SEMI-SOLIDS.

Bread.

Biscuits.

Oatmeal gruel.

II. LIQUIDS.

Milk.

Aerated waters (filtered).

It would be interesting to see an accurate

daily record of the food supplied at every meal throughout a term at several schools. Its publication would create an alteration in the question of monotony of food which no argument could effect.

X.

THE QUANTITY OF FOOD REQUIRED FOR YOUTH AT SCHOOL.

I NOW proceed to discuss the quantity of food required at school during adolescence, which is one of the most important items in this treatise. In considering this question it must be borne in mind that adolescents require food for two purposes.

1. To supply the loss incidental to wear and tear, which process is far more active during youth than at any other time of life, except in earliest infancy. 2. To provide material for the purpose of growth. And here the enormous amount of food required, in order to add one inch to the height or one pound to the weight, must be carefully remembered. This question has rarely been sufficiently recognized by

masters ; and schoolfellows are sometimes apt to designate the boy with a large appetite as a pig, or, if they do not mention the word, they signify it with equal plainness by imitating the dialect of that useful animal. This is wrong. Those who have large appetites while growing should be encouraged to satisfy them reasonably, in order that growth may attain its greatest extent. But, while saying this, I condemn a greedy boy, *i.e.* one who looks out for the best pieces, and strives to get served first—in fact, who is always looking out for himself. But with the necessary exclusion, no boy should be stinted in the quantity of staple food.

With girls at school it is sometimes considered unladylike to have a large appetite, and they stint themselves, or satisfy their cravings on the sly—both of which should be deprecated—rather than appear to possess this imagined fault. Girls should be taught by their seniors to aim at growing into the finest specimens of their race, for no woman can be too well developed in height and figure during the years

of growth, and it is only during these years that such perfection can be attained. They should, therefore, like the gardener, be encouraged to produce the best specimens of their race, not only for their own sakes, but for the benefit of the subsequent generation.

Many are the boys and girls who have been maimed for life through insufficient food during the years of growth. And girls, owing to the extraordinary rapidity of their growth during the years from ten to fifteen, suffer far more than boys, whose growth is less rapid, and is extended over a greater number of years. In children at school, who are rapidly growing and developing, hard mental work with insufficient food is equivalent to overwork, and tends to brain-disease and death.

I have said a great deal already about the importance of supplying the right kinds of food, and in the right proportions. It is clear that any food is better than none, and the wrong quality is better than deficient quantity. *Sufficient* food is the most important point

of all ; *appropriate* food is only second in importance.

But different individuals require different amounts of food, and this point is scarcely ever regarded. Some children are capable of consuming, and do not seem to thrive without, a large quantity of food, while the same amount to another would prove a positive poison, and cause ill health and disease.

For the healthy performance of all the functions of the body, the supply of food should be equal to the demand. Where work, mental or physical, has to be done, food must be sufficiently supplied ; while during repose and idleness, a very small quantity suffices. So that it is sound doctrine, morally and physically, that the man who will not work should not eat.

Plain bread and water are wholesome, and if enough be supplied, will enable growth of some kind to take place. Nothing can justify any master in limiting the supply of food. I, therefore, propose to suggest, for the guidance

of those who board boys at school, a scale of sufficiency of the various kinds of food. It must be borne in mind, too, that if one of the articles be diminished, others in due proportion, according to their nourishing qualities, must be increased. For instance, if a pound of meat were taken away, the substitution of an extra pound of bread would not be an equivalent of nourishment.

Then, again, it must be remembered that a youth who well masticates his food, will thrive better than another who eats half as much again, but bolts it.

And not only so, but efficient mastication during childhood and youth is essential for the proper development of the jaws, and for the preservation of the teeth. Without this, imperfect growth of the jaws, a high-arched palate, and irregular and crowded teeth are sure to follow.

In feeding a number of boys, too, the average must be taken, for some children always require a larger amount of food than others to keep

them in the same health, while some will not eat the estimated quantity. In providing, therefore, for numbers, the caterer must arrange for a surplus, since at one time more will be eaten than at another, and one set of youths may eat more than another set. In this way there will always be abundance without waste.

All these points must be carefully considered in providing for the feeding of youth at school.

THE COMPOSITION OF FOOD.

For scientific purposes, all foods are divided into classes, with a view to estimating their constitution and power of nutrition : viz.—

1. Nitrogenous substances which comprise meaty, or albuminous, foods.
2. Carbo-hydrates, as starch and sugar.
3. Fats.
4. Mineral matters.
5. Water.

A certain proportion of each class of food is required in order that the body may be nourished

and grow. A mixture of foods is essential, as some foods are rich in nitrogenous substance, for instance, and very poor in carbo-hydrates. In order, in such a case, that the system may obtain the requisite amount of carbo-hydrates, an enormous quantity of nitrogenous food would require to be taken, which would give increased work to the system, and thus hamper it considerably, and generate disease.

Let us now consider the amount of nitrogenous food which is required by youth.

1. *Nitrogenous Substances*.—It has been stated by Dr. de Chaumont that the amount of nitrogen which is necessary to be supplied during youth may be estimated in the following way. He shows that the amount of nitrogen eliminated from the body in the form of urea, during a state of perfect repose, is equivalent to $1\frac{1}{8}$ grains per pound weight of body.

If we, therefore, take the weight of an average child, of fifteen years of age, as 90–100 pounds we should require 110–111 grains of nitrogen in the diet.

But as children take exercise, we must allow, in technical language, 100 foot-tons as the amount of work done; and if we add one grain for each foot-ton, we find that about 220 grains should be provided for the average child. For younger children less would be required: for older children, more.

This amount of nitrogen is represented by three ounces of water-free albuminate food, which, as meat is three-quarters water and one-quarter solid material, would involve twelve ounces of meat, without bone. But inasmuch as other nitrogenous material is supplied—for instance, in eggs, milk, cheese, peas, etc.—the amount of actual meat required will not be so great.

A youth weighing 100 pounds, and undergoing ordinary exercise, in twenty-four hours, requires—

3 ounces of water-free albuminate food.

2 ounces of fat.

12 ounces of carbo-hydrates = starch or sugar.

$\frac{3}{4}$ ounce of mineral matter.

If the work be greater than the standard above assumed, the food must be increased : if the work be less, the food should be diminished. If work be taken out of him without the necessary food, not only does less work result, but we produce so much deterioration, physical and mental, that ultimately he will be incapable of working at all, and the growing youth is thus left permanently damaged.

Meat, milk, and eggs are the best forms in which the nitrogenous food can be supplied to youth, as they are so easily digestible. If meat be the staple food, then eight ounces should be given, without bone, to each child weighing 100 pounds.

2. *Carbo-hydrates*.—These are given chiefly in the form of sugar : of bread, which contains about 50 per cent. of starch ; and of potatoes—children weighing 100 pounds requiring about twelve ounces of the latter.

3. *Fat* in some form must be supplied, which many children unfortunately dislike, while others eat it with avidity. Two ounces are at least

required. Undoubtedly butter is the best form in the case of children ; but fat of meat, suet-puddings, and the cream in milk are also excellent forms.

4. *Mineral Matters.*—These are an absolute necessity for the nutrition of the young. They are obtained largely from the various articles of food. But they should be increased in the form of salt. Now, parents and masters do not sufficiently recognize the importance of children eating salt with their food, and many children continually eat their meals without it. This is a great error, for salt, as I have already shown, is an absolute necessity.

Much of the decay of teeth in children arises, I believe, from our using white bread, since in this way we throw away the outside of the grain of corn, which contains the largest amount of the salts, represented by phosphates of lime and magnesia, which are required to ensure sound teeth. In analyzing a sample of white flour, Dr. de Chaumont found that it was deficient to the extent of from 60 to 70 per cent.

of the mineral matter. Is it not time, therefore, that we made bread with flour which contains the whole of the grain of corn? Is it not time that *whole-meal bread* were sometimes used instead of the very white bread which is at present consumed?

There is another class of substances required for the complete nutrition of the system, and for the prevention of the symptoms of scurvy. This class consists of the vegetable acids, such as the citrates, acetates, and tartrates, which are contained in most succulent vegetables, potatoes, and ripe fruits. Children are peculiarly sensitive to their absence from the diet, and means should be continually taken to persuade them to partake of vegetables and fruit freely, so as to prevent the occurrence of scorbutic symptoms. Fruit should form a large share in the growing child's diet table. They have a craving for it, only less in degree than that for sugar and its allies.

5. *Water*.—In all foods water is abundant, and is essential to the due nutrition of the

tissues of the body. About two pints and a half are required daily in addition to the water contained in the food, which amounts to about two pints more.

It is now essential that I should discuss the *quantities* of the various kinds of foods that should be provided for youth, so that there may be sufficiency without waste, and abundance without excess.

I propose to assign the quantities by the week rather than by the day, as some of the articles are only required every other day, and confusion would thus ensue unless this plan be adopted.

As girls grow much more rapidly than boys, and complete their growth during a fewer number of years, they require an excess of food at an earlier age than in the case of boys. I, therefore, propose to make a distinction between the sexes, so that there may be no dearth of the supply of food when the purposes of growth and development demand it. I shall therefore describe :—

1. The requisite diet for boys from nine to fourteen years of age—a period of five years.

2. The requisite diet for boys from fourteen to nineteen years of age—a period of five years.

3. The requisite diet for girls from eleven to sixteen years of age—a period of five years.

If girls' diet were only to be supplied at a parallel rate with boys, an insufficiency would exist during three years of their most rapid growth in height and weight, and an excess after they had finished growing, at sixteen years of age; for after the latter stage they do not require so much, nor could they eat it.

The usually accepted standard diet is that of Moleschott's, thus:—

Standard Diet.	Oz. Av.	Grammes.
Albuminates	4·59	130
Fats	2·96	84
Carbo-hydrates	14·26	404
Salts	1·06	30
Total water-free food.....	22·87	648

It is represented in another form by Mole-schott, thus :—

Standard daily diet for an adult man in ordinary work.	
	Grains.
Nitrogen	317
Carbon	4750
Hydrogen	202
Sulphur	24
Salts	461

It must be remembered here, however, that this treatise relates only to the highest standard of feeding for the most expensive schools.

The following tables, however, can still be readily utilized for less expensive schools, and yet provide an equivalent food containing the same ingredients, but costing less.

In describing the diet for high-class expensive schools, I have naturally taken meat as the type of the nitrogenous food, as it is not only the most agreeable form in which that food can be eaten, but it is also the least bulky and the most easily assimilable, and can therefore be digested quickly and with the least amount of waste.

In schools where the quantity of meat specified in this treatise cannot be provided on account of the expense, it must be borne in mind that the vegetable albuminates are very similar in chemical composition to the animal albuminates, and in many instances actually richer in nitrogen. It must also be noted that cheese is far richer in nitrogen, and very suitable in forming a standard diet for youth, when not given in the evening.

Let me state a few of the percentages of nitrogeneous food as instances for comparison.

	Nitrogenous substance per cent.
Beef.....	21·39
Egg.....	12·55
Codfish.....	18·50
Cheese—	
American.....	37·20
Cheddar.....	44·47
Gloucester.....	49·12
Oatmeal.....	15·50
Peameal.....	28·10
Lentils.....	24·81

So that every boarding-school can provide a diet equivalent to the highest I have described, by diminishing the meat, and increasing the oatmeal, peameal, lentil, and cheese supply, in winter, and giving beans and peas in the summer.

I append a table which shows the height and weight of youth at the various ages, and hence enables us to note the years in which the greatest amount of food is necessary for the growth of the body.

Average of height and weight of boys and girls of English-speaking races. Calculated from the totals of British and American statistics.

Boys.

Age.	Height in inches.	Gain in height per age.	Weight in pounds.	Gain in weight per age.
5	41'30	—	40'49	—
6	43'88	2'58	44'79	4'30
7	45'86	1'98	49'39	4'60
8	47'41	1'55	54'41	5'02
9	49'69	2'28	59'82	5'41
10	51'76	2'07	66'40	6'58
11	53'47	1'71	71'09	4'69
12	55'05	1'58	76'81	5'72
13	57'06	2'01	83'72	6'91
14	59'60	2'54	93'46	9'74
15	62'27	2'67	104'60	11'44
16	64'66	2'39	120'00	15'10
17	66'20	1'54	129'19	9'19
18	66'81	0'61	134'97	5'78

GIRLS.

Age.	Height in inches.	Gain in height per age.	Weight in pounds.	Gain in weight per age.
5	41'05	—	39'63	—
6	42'99	1'94	42'84	3'21
7	44'98	1'99	47'08	4'24
8	47'09	2'11	52'12	5'04
9	49'05	1'96	56'28	4'16
10	51'19	2'14	62'17	5'89
11	53'26	2'07	68'47	6'30
12	55'77	2'51	77'35	8'88
13	57'96	2'19	87'82	10'47
14	59'87	1'91	97'56	9'74
15	61'01	1'14	105'44	7'88
16	61'67	0'66	112'36	6'92
17	62'22	0'55	115'21	2'85
18	62'19	—	116'43	1'22

Here follow three tables specifying the quantity of food necessary for the school ages of boys and girls. They, of course, only represent the average quantity required in catering for a number. For while one boy could not possibly eat the allowance specified, another would eat considerably more, and this is easily explained when one sees the difference in height and weight of boys of exactly the same age. For instance, of two boys of the same age and in the same form, the one is under five feet, and the other over six feet.

TABLE of the quantity of food required for BOYS UNDER 14, <i>i.e.</i> the age of those who are educated at private schools from 9 to 14 years—a period of five years.		
Articles of Diet.	Quantity required per week.	Remarks.
	Ounces.	
Carbo- hydrates	Bread..	Should sometimes be made of whole-meal flour.
	Starches { Oatmeal	Eaten with salt, or with sugar and milk.
	Sugar	For all purposes.
	Fat.... { Fat....	As lard, dripping, and butter for cooking.
	Fats ... { Butter..	Exclusive of the amount used in cooking.
Nitrogenous sub- stances.....	Milk..	Twenty ounces make a pint.
	Soup..	Supplied three times a week only.
	Meat..	Including the sundry meats supplied at breakfast, and including bone.
	Fish..	Supplied twice a week only at breakfast. During the season it may be supplied occasionally at dinner with benefit.
	Cheese	Supplied three times a week at dinner.

TABLE of the quantity of food required for BOYS UNDER 14, *i.e.* the age of those who are educated at private schools from 9 to 14 years—a period of five years.—*Continued.*

Articles of Diet.	Quantity required per week.	Remarks.
Potatoes	Ounces. 37·32	They are more nourishing when steamed than when boiled.
Vegetables { Greens	14·0	This includes salads, and all vegetables except potatoes.
{ Veg. for soup . .	4·66	The weight means <i>after</i> they are prepared for cooking.
Puddings	18·66	Including all puddings and pastry.
Cakes and buns . .	9·32	These should be supplied occasionally for tea.
Fresh fruit	10·6	In winter there should be more preserved and less fresh fruit. In winter, however, apples are plentiful.
Pastry . . { Preserved fruits, } { honey, treacle. }	10·6 {	Such as stewed pears, prunes, figs, etc., and all kinds of jams and marmalade.
Water	93·24	

TABLE of the quantity of food required for BOYS OVER 14, <i>i.e.</i> the age of those who are educated at our public schools, viz. from 14 to 19 years of age—a period of five years.		
Articles of Food.	Quantity required per week.	Remarks.
	Ounces.	
Carbo- hydrates	{ Starches { Bread ..	Should sometimes be made of whole-meal flour.
	{ Oatmeal	Eaten with salt, or with sugar and milk.
	{ Sugar.....	For all purposes.
	{ Fat	As lard, dripping, and butter for cooking.
	{ Fats ... { Butter..	Exclusive of the amount used in cooking.
Nitrogenous sub- stances	{ Milk ..	Twenty ounces make a pint.
	{ Soup ..	Supplied three times a week only.
	{ Meat ..	Including the sundry meats supplied at breakfast, and including bone.
	{ Fish ..	Supplied twice a week only at breakfast. During the season it may be supplied occasionally at dinner with benefit.
	{ Cheese	Supplied three times a week at dinner.

TABLE of the quantity of food required for BOYS OVER 14, <i>i.e.</i> the age of those who are educated at our public schools, viz. from 14 to 19 years of age—a period of five years.— <i>Continued.</i>		
Articles of Food.	Quantity required per week.	Remarks.
Vegetables { Potatoes Greens Veg. for soup . .	Ounces 56	They are more nourishing when steamed than when boiled.
	21	This includes salads and all vegetables except potatoes.
	7	The weight means <i>after</i> they are prepared for cooking.
Puddings	28	Including all puddings and pastry.
Cakes and buns . .	14	These should be supplied occasionally for tea.
Fresh fruit	16	In winter there should be more preserved and less fresh fruit. In winter, however, apples are plentiful.
Pastry .. { Preserved fruits, } honey, treacle . }	16 {	Such as stewed pears, prunes, figs, etc., and all kinds of jams and marmalade.
Water	140	

I fear that some of my readers, on perusing the above table of the quantity of diet which youth requires in order to attain his full development, will be disposed to think that it is the wild scheme of an enthusiast. So far, however, from this being the case, I have compared it with the actual working table of a first-rate boarding-house in one of the best public schools of England. I will not say that it is the identical table, for some few articles of diet were being given in excess, and others slightly deficient, in respect of what I consider to be requisite for growing youth. In some of the essential articles, as, for instance, meat, milk, and bread, the figures I have quoted are absolutely identical ; while the vegetables did not nearly reach the figures I have quoted.

But even this boarding-house, well-nigh perfect in its *quantity* of food, failed to give sufficient *variety* ; which could have been done without extra cost in money, but with only a little extra trouble in thought.

This diet-table provides a sufficiency on the

average for the boys of various sizes and ages in a school.

There can be no doubt whatever, that the reason of this deficiency of variety is due to the fact that the matter has never received the attention its importance demands. Yet it must be recognized, that it is far from appetizing that one should know exactly what foods he is to eat on any given day of the week, with a monotonous continuance of the routine for twelve or thirteen weeks consecutively. All I ask is more thought, more trouble, and less *laissez faire*.

As the question of the *quantity* and the *variety* of the food at school has received more attention of late years, I have deemed it expedient in this second edition to reinvestigate the whole subject so as to eliminate error as far as possible.

I, therefore, selected the school where I know the boys are fed according to my ideal of what should be: where no pains are spared to see that the food is appetizing in appearance, in quality, and in variety; and where the boys are loud in their praise of their commissariat. The

caterer, most kindly, placed in my possession every information in his power.

In this school it is a pleasure to see the table laid. The tablecloth is always clean : there is no "week-end" tablecloth, in its repulsiveness, although boys are proverbially careless in spilling things at meals. The appliances are good and clean, and the crockery wholesome-looking. The whole betokens both care and thought. The quantities work out as shown on pages 181 and 182 ; but they will vary somewhat in the different seasons. I was not able to estimate them for the whole year.

I would here, again, call attention to the fact, that it is from the nitrogenous or albuminous food that most of the tissues of the body are formed and repaired ; and that a large amount of nitrogenous food, whether derived from the animal or vegetable kingdom, is required for hard work, whether mental or physical.

Those who take no exercise at all should, of course, have less allotted to them, or disease is certain to be generated. In the case of girls,

TABLE of the quantity of food supplied at School, to BOYS between the ages of 14 to 19 years.		
Articles of Food.	Quantity supplied per week.	Remarks.
Carbo-hydrates	Bread . . .	Distributed in rolls, small loaves, and cottage loaves. Eaten with salt, or with sugar and milk. In the form of rice, sago, and cornflour. For all purposes. As lard and dripping for cooking purposes.
	Starches { Oatmeal ..	
	Farinaceous	
	Sugar	
	Fats { Fat	
Nitrogenous substances	Butter	Twenty ounces make a pint. Not estimated. Including bone. Breakfast meats, such as ham, bacon, and sausages.
	Milk	
	Soup	
	Butcher's meat	
	Breakfast meats	
	Fish	
	Cheese	
	Eggs	An egg weighs two and a quarter ounces.

TABLE of the quantity of food supplied at School, to BOYS between the ages of 14 to 19 years.—*Continued.*

Articles of Food.	Quantity supplied per week.	Remarks.
Potatoes..	Ounces. 59	{ Most of these vegetables are from the garden. Lettuces twice a day in summer; and cucumbers <i>ad libitum</i> in the season.
Vegetables { Greens ..	?	
Vegetables { for soup	?	
Fresh fruit	15	
Puddings	?	
Pastry { Preserved fruits	2·5	
Tea, coffee, and cocoa	3·33	

TABLE of the quantity of food required for GIRLS during their most rapid years of growth,
i.e. from 11 to 16, in height and weight—a period of five years.

Articles of Diet.	Quantity required per week.	Remarks.
	Ounces.	
Carbo- hydrates	(Starches { Bread ..	Should sometimes be made of whole-meal flour.
	{ Oatmeal	Eaten with salt, or with sugar and milk.
	{ Sugar	For all purposes.
	{ Fat	As lard, dripping, and butter for cooking.
	{ Fats ... { Butter ..	Exclusive of the amount used in cooking.
Nitrogenous sub- stances	Milk ..	Twenty ounces make a pint.
	Soup ..	Supplied three times a week only.
	Meat ..	Including the sundry meats supplied at breakfast, and including bone.
	Fish ..	Supplied twice a week only at breakfast. During the season it may be supplied occasionally at dinner with benefit.
	Cheese	Supplied three times a week at dinner.

TABLE of the quantity of food required for GIRLS during their most rapid years of growth,
i.e. from 11 to 16, in height and weight—a period of five years.—*Continued.*

Articles of Diet.	Quantity required per week.	Remarks.
Potatoes	Ounces. 56	They are more nourishing when steamed than when boiled.
Vegetables { Greens..... Veg. for soup..	21 7	This includes salads and all vegetables except potatoes. The weight means <i>after</i> they are prepared for cooking.
Puddings.....	28	Including all puddings and pastry.
Cakes and buns..	14	These should be supplied occasionally for tea.
Fresh fruit	16	In winter there should be more preserved and less fresh fruit. In winter, however, apples are plentiful.
Pastry .. { Preserved fruits, honey, treacle. }	16 {	Such as stewed pears, apricots, prunes, figs, etc., and all kinds of jams and marmalade.
Water.....	140	

this fact is most important to remember, and the remedy lies, *not* in stinting them in food and exercise, but in increasing the exercise and food to an appropriate degree.

The *quantity* of meat or nitrogenous food supplied in the twenty-four hours at breakfast and dinner, should consist of one pound of uncooked meat, including fat, which means 20 per cent. of weight of bone, 20 per cent. of weight which is lost in cooking, and giving therefore 60 per cent. of fat and lean cooked meat, or 9·6 oz.

I have furnished the full amount of meat-food that is wholesome for the strongest and biggest boys and girls, or those who are growing rapidly. I have done this purposely, though I am aware that younger and less robust boys and girls could not consume the quantity I have specified ; for them, three-quarters of a pound of uncooked meat is the usual amount required.

There are, however, some highly bred delicate girls and boys who, with their very spare appetites, are unable to take sufficient nitrogenous food at breakfast and dinner to provide for daily

growth and wear and tear: such children, few in number though they be, should be allowed an egg, or a little fish, or a cutlet at tea-time, or some beef-tea at lunch-time, if school-life is to be a life of health and progressive growth, and an earnest preparation for subsequent work in the world.

XI.

THE DIET IN TRAINING FOR SCHOOL-GAMES.

THE question of the diet required in the *training* for school-games unfortunately lies at present in the hands of the boys themselves, whose eccentricities in the matter would be ludicrous were they not so detrimental to health. At present some boys are not only allowed to follow the devices and desires of their own hearts in this matter; but also to insist upon others coming into line with their fancies and fads.

From this position it should be extricated without delay. The course which is open to the school authorities to pursue is that of education and persuasion.

In discussing this question the conditions affecting it must be borne in mind, or a grave misconception of the subject will prevail.

In training, the diet may be altered with benefit both to the young and the adult. Between the two classes, however, the conditions are as opposite as the poles. In the adult, growth and development have ceased, while in youth they are proceeding at their highest rate of progress.

To express it briefly, the diet of training means that certain articles of food are abstained from, while others are taken in excess. Now these are the very conditions which impede—and this indicates, be it remembered, lost ground which can never be recovered—both growth and development. For it is here that great variety is essential, so that every tissue of the body may claim its appropriate ingredients for its nourishment. A lengthened abstention, therefore, from such articles as sugar, fat, and farinaceous foods can only be attended with disastrous results.

The most injurious fact connected with the diet of training is that the elder boys and the athletes have the power of compelling abstention

from these articles in all boys, more or less, for a whole term. This evil, too, though the main one, is not alone. For where it becomes the fashion for the elder, or influential, boys to abstain from certain articles of food, the younger follow suit, from force of example.

Yet it should be an invariable rule that only strong hearty boys should undergo "training." No delicate boy, nor even a sound boy with a delicate parentage, should be allowed to go into training; or the delicacy, which might have remained dormant, or missed the individual altogether, may be started, and thus all chance of good health be removed.

Did training merely involve abstention, for a time, from the luxuries of the pastrycook, the result in many respects would be excellent; but where it extends, as is usually the case, to the refusal of some of the staple articles of food provided at meal-times, it becomes a serious wrong.

The question that will naturally be raised, therefore, is this—Can a training diet ever be used during adolescence without inflicting harm

upon youth? Yes, certainly ; but only where it is legitimately resorted to by the strong and healthy. In such cases, it may not only be safely had recourse to, but with actual benefit for a week or two immediately before athletics, a boat-race, a gymnasium competition, or similar active exertion.

Many state that boys should never vary their diet in training for severe exercise. All I can say again is this, that the boys who diet themselves in training are the "winners." And I have had the strongest testimony from boys themselves—those who have gained the highest rewards—that a training diet with careful avoidance of the "tuck-shop" is essential to success. Moreover, when a boy who should have succeeded has failed, it is one of the commonest observations among them, that "he didn't take the trouble to train." Such evidence refutes all theories.

But when a training diet is enforced for a whole term of three months, as is frequently the case during the football season, irrevocable

injury to health must ensue. And boys go home for the vacation looking jaded, and deficient in weight. It furnishes then another instance of a beneficial proceeding becoming transformed into a deleterious one, by reason of the ignorance of boys and the want of thought of masters. The course that is required to bring training back into its legitimate channel is that the school authorities should grasp the facts, and then endeavour to teach boys the right plan, and thus remove the present attendant evils.

The meaning of training is to improve the wind ; to increase the tone and vigour of the muscles, including the heart ; and to remove superfluous weight, and for a time prevent its increase. All of these conditions diet possesses a great power in influencing.

In the growth of the young, a diet containing carbonaceous, or fat-forming material, such as sugar and farinaceous foods, together with fat itself in its various forms, is an absolute necessity, since animal heat mainly depends

upon them. To dispense with such articles of diet, for more than a very short time, entails ill health, and arrests growth and development.

The *diet* required for boys in training, in order to prevent the fresh deposit of fat, is as follows ; but, I would again repeat, fourteen days of it is sufficient.

THE BOY MAY EAT

Mutton.	Haricots.
Beef.	Spinach.
Veal.	Watercress.
Lamb.	Mustard and cress.
Tongue.	Lettuce.
Kidney.	Asparagus.
Sweetbread.	Celery.
Soups, unthickened.	Radishes.
Beef-tea and broths.	French beans.
Poultry.	Green peas.
Game.	Brussels sprouts.
Venison.	Cabbage.
Potted meats.	Cauliflower.
Fish, except salmon and eels.	Onion.
Custard.	Broccoli.
Cheese.	Seakale.
Eggs.	Jellies, flavoured but not sweet-
Bread, especially crust, or	ened.
brown bread, or toast.	Fresh fruit in moderation, and
Oatmeal.	without sugar or cream.
Lentils.	Pickles.

THE BOY MAY DRINK

Tea.	Apollinaris water
Coffee.	Soda water.
Cocoa, from nibs.	Seltzer water.
Milk, in moderation, especially buttermilk and skim-milk.	Salutaris water.

THE BOY MAY NOT EAT

Duck.	Rice.
Goose.	Arrowroot.
Fat bacon and ham.	Sago.
Fat of meat.	Tapioca.
Butter.	Macaroni.
Cream.	Vermicelli.
Sugar.	Semolina.
Potatoes.	Pastry.
Carrots.	Puddings, all kinds.
Parsnips.	Sweet cakes.
Turnips.	Condiments, excepting salt.
Beetroot.	Marmalade.
Artichokes, Jerusalem.	Jam.

THE BOY MAY NOT DRINK

Cream.	Alcohol, in any form.
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The above diet need not be, and should not be, rigidly followed. It is afforded as a type of the diet which helps to prevent the generation of fat, and ensures the possession of the strongest "wind" and vigour. But, as I have already said, those who are growing must not

be deprived of fat, sugar, and starch for more than a few days consecutively.

In training, so as to obtain good "wind," it is of the very highest importance to avoid all possibility of indigestion, the insidious obstacle of the object aimed at. The boy, therefore, should eat slowly, and masticate thoroughly: he should take no active exercise for an hour after a meal; he should never eat or drink between meals; and should always go to bed, and to sleep, by 10 p.m., and rise early in the morning.

There is a most fallacious theory amongst all trainers, whilst undergoing training, be they boys, men, or horses; namely, that the smallest quantity of fluid must be allowed. Those, therefore, in training often really suffer from actual thirst. It is an undoubted fact, that most people take daily more fluid than is requisite to satisfy thirst; whereas a simple satisfaction is all which the system needs to perform its functions healthily.

The right principle to adopt in training is

this—that water should be freely allowed, but always in small quantities at a time ; always sufficient to satisfy thirst, though the trainer should never allow himself to become actually thirsty. As he perspires an ounce of fluid from his body, another ounce of water should at once be supplied in its place. On no account should he suffer thirst for minutes or hours, and then, when the exercise is over, inflate himself, as many do, with fluid, which produces discomfort, takes away appetite, and causes indigestion and loss of sleep at night. Dry tissues, and unnaturally thickened thirsty blood, are incapable of the highest exercise of their functions.

It is always wiser to eat before drinking.

The time of exercise for training should certainly not begin until two hours after a meal ; neither should the adolescent have been longer than four hours without food, or otherwise he will be faint before his exertion is finished, and the exercise will be blamed instead of his own imprudence.

This subject is worthy of more attention from

school authorities than it at present receives, for the wise, or injudicious, application of the principle which it contains will prevent, or entail unnecessary injury on the young.

XII.

THE DIET IN SICKNESS AT SCHOOL.

THIS is, or should be, entirely in the hands of the medical officer of the school, unfettered by parents or masters, and controlled solely by the constitution of the sufferer and the nature of the illness from which he is suffering.

As the doctor does not pay for the food, no quibble can ever arise that an apparently deficient supply is due to meanness.

On the other hand, if he is too generous in his sick diet, which another pays for, a word of remonstrance should be sufficient to check it.

But because a youth is ill at school, parents must not expect that he is to be fed on dainties and luxuries, except under special circumstances. As a rule, they are not only unnecessary, but injurious.

The treatment of most acute illnesses requires

at their commencement the food appropriate to infancy, and when the illness is terminating, good plain, wholesome, blood-forming food, if the appetite is good. The appetite rarely fails in the young after an illness, and is often enormous during convalescence. For the youth has not only to supply the wear and tear, which is great during illness attended with fever, as well as to recuperate the wasted body, but he has, in addition, to provide for growth. If during an illness the appetite fails, or if after an illness the appetite does not return, then the sufferer demands, and I am sure always obtains, every dainty that can be imagined to whet his appetite, and restore him to health and strength.

Parents never need trouble themselves on this score, for illness is always so expensive in every way, that school authorities are only too keen to avoid it, and get their pupils restored to health as soon as possible. Moreover, illness at school is no credit to any one, and the self-interest of schools is always sufficient to prevent neglect during sickness.

I do not propose to discuss the question of food in illness at school in its entirety. For every case of sickness, and every variety of age and constitution, require from day to day, and from hour to hour, to be treated on their own merits. But I cannot refrain from entering my protest against the imbecile notion of parents—fostered, I grieve to say, too frequently, by their medical advisers, that the various patent concentrated foods are preferable in sickness and reduced strength, to freshly cooked foods prepared in the kitchen. The former have their use, without a doubt, but they are grossly misused, in a large number of instances, to the serious detriment of the suffering child.

During an illness it is imperative, as I have stated, that children should not have any food supplied except through the doctor in attendance, and nothing but what he orders or sanctions should be given, from whatever source it be sent. Unless this rule is enforced, the gravest catastrophes must happen from time to time.

The great obstruction to this most salutary rule is that every one thinks himself a "bit of a doctor:" the good nature of these "bits of doctors" is apt again to exaggerate their ignorance, and unless there is the keenest surveillance on the part of the doctor, together with firmness and faithfulness on the part of the nurse in charge, consequences ludicrous, were they not so serious, would frequently occur.

It seems so kind and good-natured, when a child or a pupil is ill, for a parent, or a master, to send him something to eat or drink. But it is not kind: it is positively unkind. The only kind attention to the sick boy or girl, in order to carry out this natural desire, is to leave the doctor the absolute judge and supervisor. This, however, is not the same thing: the pleasure consists, not so much in seeing that the sick receive what is appropriate, but in personally giving it. I ask, Is not this really bestowing the pleasure upon themselves rather than upon the sick, who can receive it without their aid; and thus resolves itself into pure selfishness, however

considerately intended, after all? Why is it that so many human beings think themselves capable of treating disease? Is illness such a trifling matter that every one is competent, without a special education, to its treatment?

In order that I may make the matter quite clear, I will give one or two instances, out of many, to show the importance of the doctor possessing sole control over the feeding of sick children, and of being severe in dealing with any infringement of the rule. For instance—

It was once suggested, by one of the kindest-hearted ladies, to a nurse, who was nursing a case of acute rheumatism for me, that, as the boy did not care for his milk diet, and was looking very poorly, a salmon steak should be given him!

At another time grapes and other fruit were sent for a case of typhoid fever! Meat-pies, and other extraordinary articles for cases of acute illness, are everyday occurrences!

It often happens to me that a hamper arrives full of articles so inappropriate for the illness,

that they have to be divided entirely amongst sick schoolfellows who are less ill, or who are convalescent from illness.

One must expect parents to grumble at the appropriate feeding of the sick, when one sees the unwise food that they send to their sick children in hampers.

But parents are discontented, too, on other grounds, which are equally unreasonable; *e.g.* I once had a boy ill with chicken-pox, and as soon as it was over he was fed as freely as he could eat, and his appetite was excellent. But because I did not order him pheasants and partridges and grouse, instead of butcher's meat, the parent was dissatisfied. The parent did not know that butcher's meat was far more suitable as a blood-making food for a rapidly growing boy than any amount of game. Of course her grievance was this, that he did not receive the more expensive food. Had butcher's meat been more expensive than game, and had I given him game, the same dissatisfaction would have been expressed.

It is not to be wondered at, that youth, especially boys, accustomed to continual self-indulgence in eating and drinking, generally find fault with sick fare. Who does like sick fare? It is not a question of what the sick like when ill, but which is the best way to get over the illness as quickly as possible, without the legacy of any permanent ill effects. But the young, of course, do not realize this, and naturally dislike the ordeal.

The only course to pursue is simply to strive to do what is right, and to turn a deaf ear to the grumbler.

XIII.

CONCLUSION.

IN this short treatise on a most important school question, I have striven to point out that the diet of youth is a matter of moment not only during that period, but in after-years. If the diet has been poor in quality and insufficient in quantity, growth and development will have been impeded, and the adult will be small and feeble, and less fitted to sustain his part in life. If, on the other hand, the food has been of an improper kind and imperfectly cooked, indigestion will have ensued, and may entail much discomfort throughout life, and much imperfection of temper. The diet of youth, therefore, requires as much consideration as that of adults, and will repay all the thought and care that can be bestowed upon it. A sound physical frame, animated by alert faculties, and superintended

by a serene mind, will, so far as proper diet can secure them, follow in the one case: a stunted and enfeebled frame, the consonant abode of sluggish powers and unvigorous mind, will similarly, in the other case, result.

I have also tried to show that the cooking of the food is most important, in order that ill health may be avoided.

Briefly, I have endeavoured to point out that natural cravings should be regarded; that it is unwise both to deny articles of food for which the system craves, as well as to compel the eating of food to which the system has a natural dislike.

I have aimed at discussing the material required at school to establish the highest state of health and efficiency: with anything short of the highest standard I could not be content. It is quite certain that life is compatible with a lower standard. But in that case will be found a considerable deterioration of system to which the body accommodates itself, as it does to many other circumstances that it has to

endure. The highest state of health, however, and the most perfect growth and development of the body, can only be obtained by a rigid attention to the diet of youth.

Some of our best schools, on this food question, are as well-nigh to perfection as can be realized. My desire has been throughout to indicate the usual faults in most schools, and to point out how excellent results may be secured in every school where boys and girls are educated.

Sound bodily health, finally, which includes the brain, is essential for education ; and the physician who strives to attain this highest development of the body is the one who best assists the schoolmaster in his laborious work.

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